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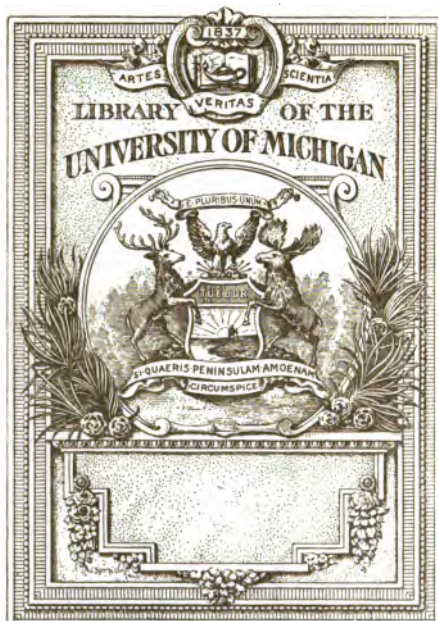
J. Humfrey Anger

A TREATISE ON
HARMONY

PART III



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A TREATISE
ON
HARMONY
WITH EXERCISES



By
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In Three Parts

PART III

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PREFACE

THE theory of the chromatic element in music, as enunciated in the present volume, is a departure from that which usually obtains in text-books. It has been in constant use, however, since the commencement of the twentieth century, and is, therefore, offered to the world of music only after due deliberation. This, the **Enharmonic Theory**, as it is called, is intermediate between that which restricts chord construction to the limits of an octave, and that which extends fundamental discords to the eleventh and thirteenth. The theory was first explained, and published, in a pamphlet entitled **The Modern Enharmonic Scale**, and the author is thus enabled, here and now, to reply to certain questions which have been raised in connection therewith; questions which, not improbably, may arise again from time to time (in the minds of those who are patient enough to examine a new method of presenting an old subject), and to ignore which might possibly infer an inability to reply to them.

i. It has been said that the enharmonic theory is calculated to circumscribe the composer.

A text-book on Harmony simply bears the same relation to the art of music that a text-book on grammar bears to literature; and, just as the latter is not "calculated to circumscribe" the poet, so the former is not "calculated to circumscribe" the composer. The real object of a work on harmony should be the theoretical education of the *student* of music, and the present treatise is no exception to the rule. There are, it may be said, two classes of composers, namely, the tone-author and the tone-poet, and the student who, after having pursued a course of harmony, evinces a taste for composition, will naturally enter the ranks of the former class, and will doubtless write in accordance with the generally accepted precepts. Should he, however, possess that vital spark of genius, which entitles him to a place in the latter class, he will then, indeed not be circumscribed by any work whatever on harmony. To the tone-poet, academic laws are his "very humble and obedient servants."

ii. It has been said that the extension of the series of chords of the diminished seventh is unnecessary and inexpedient.

One of two things is, without *any* doubt, both unnecessary and inexpedient, namely, this extension of the chords of the diminished seventh, or the conten-

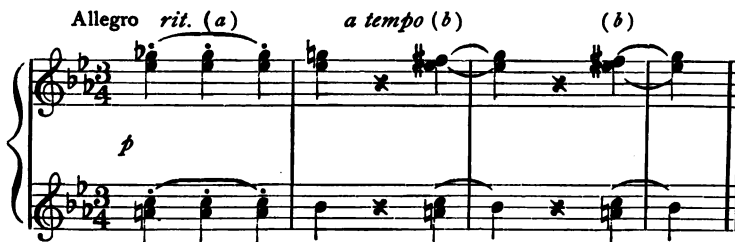
FOOT-NOTE. "This pamphlet, published in the year 1907, having fulfilled its purpose, will not be republished, the essence of the work being incorporated in the present treatise."

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tion that the great composers habitually employed false notation. The enharmonic scale, as the basis of chromatics, comprises the notation adopted in the greatest and best musical compositions; and the harmonic origin of this scale is to be found in the extended series of diminished tetrads (see Ex. 15, page 385). It is not only exasperating, but it also savors of egotism, to be constantly under the necessity of telling students that such and such a chord can only be explained by the excuse of false notation, that is to say, the chord is incorrectly written, and, that is to say, the composer is incorrect, for, of course, the teacher could not be incorrect (sic). The enharmonic theory (with its extended series of diminished tetrads) at least enables the theorist to give a logical explanation of every chord employed in the works of the acknowledged masters of classical music, with the notation adopted by the composer himself.

In this connection, one critic, after reading (?) the above mentioned pamphlet, refers to the following progressions in the first movement of Beethoven's Sonata in *E* flat, Op. 31, No. 3, measures 241-244, and states that since the chords at (a) and (b) are identically the same upon the piano, while the passage is undeniably in the key of *E* flat, therefore, one of the chords must be falsely notated.



According to the limitations of the "Day" theory, the critic, of course, is correct, for, the note *F* sharp is regarded as being foreign to the tonality of *E* flat. According to the enharmonic theory, the note *F* sharp is not foreign to the tonality of *E* flat, and both of these chords are available for use in this key; that at (a) is the (superior) diminished tetrad on the inter-dominant, and that at (b) the (inferior) diminished tetrad on the hyper-supertonic. These chords, it will be seen, occur as Nos. 3 and 6, in the above-mentioned series of pentads (Ex. 15, page 385). Now, the "Day" theorist forbids the use of the chord at (b), but Beethoven employs it, and the enharmonic theory justifies its use; surely, there is something unnecessary and inexpedient in regard to this matter. This particular passage, which was chosen by a critic (not by the author) with the special purpose of refuting the enharmonic theory, seems to be a peculiarly happy illustration of its true significance and of its exact applica-

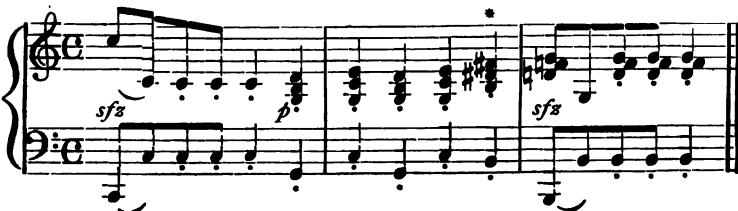
tion to musical composition; further reference to it, therefore, may be excusable. Three points are worthy of notice, namely, (1) that the chord at (b) is employed at all, which indicates that the composer recognized both chords; (2) that it is employed after the chord at (a), which infers that, under certain conditions, the notation of the chord at (b) is preferable to that at (a) and (3) that the chord at (b) is immediately repeated, which emphasizes the composer's predilection for the chord as thus written. Furthermore, may there not be an aesthetic reason for the change in notation? The portamento phrase mark over the chords at (a) would imply that this diminished tetrad is regarded as an important chord, and it is thus treated as a *fundamental* discord; whereas, the legato mark over the chord at (b), with the chord now occurring upon a weak beat, might well imply that *this* diminished tetrad is regarded as a *fortuitous* chord, the *F* sharp and *A* natural being chromatic auxiliary notes, and the *C* a diatonic auxiliary note. *G* flat is not an auxiliary note to *G* natural. Wherefore, the diminished tetrad at (b), may even be regarded as not being an independent chord at all, but as a chord of *E* flat, in its second inversion, and with its third and fifth temporarily displaced by ornamentations. The analysis of the chord from either standpoint is justified by the enharmonic theory, see chapters XX, §§ 240 and 241, and XXII, § 267.

iii. It has been said that the author, who vigorously denounces Dr. Day, is virtually a Day theorist.

This statement, which possesses a certain element of truth, is, for that very reason, all the more insidious. The author is a Day theorist only in respect to the fact that he accepts the tonic, the dominant and the supertonic as generators of fundamental discords; he rejects *absolutely*, the Day theory of chords of the eleventh and thirteenth, and he rejects also the restriction of generators (at least in the major mode) to the above-mentioned three notes; two features in the Day theory without which it would cease to exist. The following quotation from *The Modern Enharmonic Scale* should be sufficient to prove that the author can lay very little claim to being a disciple of Dr. Day.—

"As the strength of a chain depends upon its weakest link, so *one* example from a classical work will be sufficient to demonstrate the inconsistency of the Day theory. The following passage from Schubert's Sonata in *A* minor, Op. 42,

Moderato



first movement, measures 33-35, is unquestionably, in the key of *C* major. The chord marked * is unquestionably a chromatic chord in the key of *C*, for, it is immediately preceded and followed by chords which are definitely in this key. The name of this chord is, unquestionably, the common chord of *B* major, and it may be termed the leading-note major triad. As a borrowed chord, it occurs as the dominant triad in the key of *E* minor, one of the borrowing keys (page 387). This chord, it will be seen, occurs as the consonant basis of the primary pentad on *B*, in the key of *C*, Ex. 15, page 385. While, its use, by one of the great classical masters, justifies the formation of chromatic *major* triads on diatonic notes other than the supertonic (which the Day theory forbids), justifies the system of borrowing from the *relative* minor keys (which the Day theory also forbids), and indirectly justifies the *complete* series of primary pentads, which constitutes the harmonic basis of the enharmonic theory.

"From the standpoint of the Day theory, this chord would be explained as follows: since the harmonic form of the chromatic scale does not comprise the note *D* sharp, this note can only be regarded as an instance of *false notation*, and the composer should have written *E* flat, incidentally giving rise to false relation with the *E* natural in the treble of the preceding chord, but this point may be overlooked; with this change, the three notes of the chord will be found in the fundamental chord of the thirteenth on the supertonic, as the third, the minor ninth, and the major thirteenth, and the name of the chord, therefore, will be *the sixth inversion of the supertonic minor ninth and major thirteenth, with the minor ninth falsely notated, and the leading-note doubled*. Poor Schubert!"

According to the virtually-a-Day-theorist it is, simply, *the common chord of B major*, see Chapter XIX. In this connection it may be added that, although none of the three triads, *A* major, *E* major and *B* major, is recognized in the Day theory as a chromatic chord in the key of *C*, yet their use as such cannot be denied; and with their acceptance, the whole family of attendant keys becomes even more closely united with the original tonic than heretofore. One Day theorist, in acknowledging their claims as chromatic chords, ventures to call them the "false triads;" but is it not the theory rather than the triads, to which the term "false" should be applied? The fact that these triads are accepted at all by any disciple of this school is a tacit acknowledgment of the limitations of the Day theory.

Another critic opines that Dr. Day is dead, that he was a worthy man, etc., but why disturb his ashes. Would that the "worthy man" were as "dead" as the critic seems to imagine! The date of his earthly demise (1845), however, practically coincides, phoenix-like, with the birth of his harmonic theory, and it is the theory, not the man, which is under consideration. The author would be one of the last to disturb his ashes, but these ashes have been metamorphosed into seeds which have been sown broadcast in all English-speaking, not to mention other, lands. Every teacher who pins his faith to chords of the eleventh and thirteenth, or who, in pedantic manner talks of false notation, is a standing witness to the fact that Dr. Day is still a *living* force. May the present treatise become a tool with which *reposit in pace* will be carved upon his final tombstone!

The works of the best composers, both ancient and modern, teem with chromatic chords, the analysis of which from the standpoint of the Day theory, is just as complex and illogical as that of the major triad in the Schubert sonata, but which, from the standpoint of the enharmonic theory, is simple and natural. That the chromatic element in music has not hitherto been reduced to a comprehensive system, is no proof that the great composers did not employ any system at all in writing chromatic progressions. Practice comes before theory in matters appertaining to harmony; that is to say, the laws of theory are derived and deduced from the practice of the best composers.

The enharmonic theory is consistent and comprehensive; it justifies the harmonic progressions in the works of the composers of the past, and it will be applicable to those of the future, so long as the art of music is based upon the principles of equal temperament. As to its intrinsic value, time — the supreme critic in matters musical — alone will deliver an ultimate judgment.

To Mr. Edmund Hardy, Mus. Bac., for valued suggestions in reviewing the manuscripts; and to Miss N. R. Hearn, for indefatigable work in copying the examples and exercises, the acknowledgments and thanks of the author are due, and are herewith cordially tendered.

The author, furthermore, desires to express his appreciation of the work accomplished by Mr. H. Clough-Leighter, of the Boston Music Co.'s Editorial staff, the eminent critic and composer, whose erudite musicianship has been invaluable in preparing this treatise for publication.

J. HUMFREY ANGER

Toronto, Canada,
June 3, 1911.

GLOSSARY

The following terms, some of which are not in ordinary use in connection with Harmony, some of which are variously employed by writers on the theory of music, while others have been originated in order to meet the requirements of a systematic treatment of this subject, are employed in the present work as explained below.

Active Notes, or notes of motion, the supertonic, subdominant, submediant and leading-note.

Affinitive Scales, those which have the same tonic, being analogous with relative scales, those which have the same signature. Affinitive scales are in chromatic relationship, while relative scales are in diatonic relationship, with one another.

Artificial Tetrad, a chord of the seventh, the real root or generator of which is a major third below the nominal or apparent root, such as the chords of the minor and diminished sevenths, which are regarded as derivatives of pentads.

Associate Scales, the tonic, dominant and subdominant, together with both their relative and affinitive scales; these scales, nine in number, comprise the complete (diatonic and chromatic) material of a given key.

Chromatic Modification, a chord in which one of the notes is absolutely displaced by its upper or lower chromatic auxiliary note. When two or more notes are so displaced, the chord is regarded as a compound modification.

Compound Suspension, the combination of two or more single suspensions, or the compounding of one or more suspensions with another discord.

Deceptive Cadence, the dominant chord followed by the submediant. This progression is sometimes called the "interrupted" cadence; the real purpose of the cadence, however, is deception rather than interruption.

Diatonic Modification, a chord in which one of the notes is absolutely displaced by its upper or lower auxiliary note. When two or more notes are so displaced the chord is regarded as a compound modification.

Displacement, (1) absolute, as in the case of a modification, (2) temporary, as in the case of a suspension.

Dorian Cadence, a name given to the progression which arises when the Phrygian cadence (of the major mode) is transcribed to the minor mode.

Enharmonic Scale, The Modern, a chromatic scale in which certain notes are employed under two different names. This scale may be regarded as a convenient method of exhibiting the complete (diatonic and chromatic) material of a key.

Extreme Chromatic Scale, the name employed for the instrumental form of the chromatic scale, which comprises seventeen notes to the octave.

Fortuitous Chord, one arising from the use of auxiliary notes. Such a chord is not regarded from the fundamental standpoint.

Half-Note, Quarter-Note, Etc., terms indicating minim, crotchet, etc.

Heptad, a fundamental discord comprising seven different notes, a chord of the thirteenth.

Heptadic Theory, the system of harmony which comprises chords of the eleventh and thirteenth.

Hyper, a prefix indicating "chromatically raised," such as hyper-tonic.

Hypo, a prefix indicating "chromatically lowered;" it is employed only in connection with the extreme chromatic hypo-dominant.

Imperfect Chromatics, the minor supertonic, the minor mediant and the minor submediant, with their enharmonic equivalents the hyper-tonic, the hyper-supertonic and the hyper-dominant.

Interrupted Cadence, the dominant chord followed by a rest.

Interdominant, the chromatically raised subdominant; this note, being a perfect chromatic, a distinguishing term is employed in preference to hyper-subdominant.

Leading-Note Tetrad, a chord of the seventh on the leading-note, the leading-note being the actual root, as distinguished from the leading-tetrad, in which the leading-note is only the nominal root.

Major Chromatic Scale, the melodic form of the chromatic scale.

Melodic Triads, triads formed from the notes of the melodic minor scale (sometimes called the additional triads), as distinguished from the harmonic triads, those formed from the notes of the harmonic minor scale.

Minor Chromatic Scale, the harmonic form of the chromatic scale.

Minor Tetrad, an artificial tetrad in which the seventh is minor, as distinguished from a diminished tetrad, in which the seventh is diminished. In both cases the third is minor and the fifth diminished.

Modifications, modified chords, diatonic and chromatic, q. v.

Natural Tetrad, a chord of the seventh which naturally occurs in a scale, as distinguished from an artificial tetrad, a derivative of a pentad.

Note, (1) a character employed to represent a musical sound, such as half note, quarter-note, etc., and (2) a term employed to indicate a musical sound, such as leading-note, high note, wrong note. The term "tone" is not employed to indicate a musical sound, except indefinitely, as, for example, the tone of a piano. This term, together with semitone, is employed chiefly in the measurement of intervals, hence the term "diatonic."

Passive Notes, or notes of rest, the tonic, mediant and dominant.

Perfect Chromatics, the interdominant and subtonic, which are not en-

harmonically changeable, except for use as chromatic auxiliaries, or in connection with the rarely employed extreme chromatic chords.

Pentad, a fundamental discord comprising five different notes, a chord of the ninth.

Pentadic Theory, the system of harmony which comprises chords of the seventh and ninth, but rejects chords of the eleventh and thirteenth.

Phrygian Cadences, the mediant major triad preceded by, usually, a chord of the sixth on the subdominant.

Precadential Chord, a chord employed before the perfect cadence; such chords do not contain the leading-note.

Retardation, a note tied over from one chord, to which it belongs, into the next, to which it does not belong; but which, unlike a suspension, moves disjunctly.

Subordinate Chromatic Chord, one not borrowed from an associate scale, as distinguished from an ordinate chromatic chord, which may be regarded as having been borrowed, in the first instance, from a nearly related scale.

Sub-suspension, a suspension formed by the use of the lower auxiliary note, and which, therefore, rises in resolution.

Subtonic, the note a *tone* below the tonic.

Superior Tetrads and Pentads, those derived from the tonic, dominant and supertonic, as generators, in both modes; inferior tetrads and pentads occur in the major mode only, and are derived from the submediant, the mediant and leading-note as generators.

Symbol, a stenographic method of naming chords.

Tetrad, a fundamental discord comprising four different notes, a chord of the seventh.

Tetradic Theory, the system of harmony which limits chord construction to the confines of an octave.

Tonal Intensity, a term applied to the relative degrees of acuteness and gravity in connection with both diatonic and chromatic notes.

Tonal Vision, the faculty of appreciating the effect of music through the medium of the eye, sometimes called "hearing with the eye."

Transition, passing from one key into another without the use of any chord derived from the dominant of the new key.

Turning Note, an auxiliary note forming part of a turn; the passing note passes onwards, the turning note returns.

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The titles of the above chapters refer to the *principal* subjects under consideration. In Chapter XX, fundamental discords only are explained. In Chapter XXVI, reference is made to harmony in two, three, six, seven and eight parts. In Chapter XXVII, the pianoforte, the organ and the string quartet alone are considered, and even these instruments are necessarily treated upon very general lines.

A TREATISE ON HARMONY

PART III

INTRODUCTION

THE chromatic element is said to have been first introduced into musical composition by Orlandus Lassus (Roland de Lattre), 1520-1594; but, though employed more or less freely by all succeeding composers, no attempt, apparently, was made to treat this important subject *systematically* until about the middle of the nineteenth century, when a notable work on Harmony by Dr. Alfred Day was published.

It is customary in works on Harmony to treat the *diatonic* element in a systematic manner, but, unless the author is an avowed disciple of Dr. Day, not so the *chromatic* element; the more frequently employed chromatic chords are merely enumerated and briefly explained, on the lines adopted in Chapter XVIII (Part II) of the present treatise. If it be possible, however, the chromatic element, as well as the diatonic, should be treated, not only in a systematic, but also in a logical and a comprehensive manner. The Day theory, as was said above, is systematic, and it is logical as far as it goes, but it is by no means comprehensive. This theory, moreover, has given rise to abundant controversy, being accepted by many theorists as the only correct basis of the chromatic element, and being rejected by others as unsound and erroneous, from both the diatonic and chromatic standpoints.

Reference has already been made (in the Introduction to Part II) to the fact that there are, from the diatonic standpoint, three distinct theories of chord construction in vogue at the present day, and the modern student, in whatever path his steps are directed, should at least possess some knowledge of their characteristic features. These theories, in regard to fundamental dissonances, are as follows:

1. That which comprises chords of the 7th only, which may be termed the **Tetradic theory**;
2. That which comprises both chords of the 7th and 9th, which may be termed the **Pentadic theory**; and
3. That which comprises chords of the 7th, 9th, 11th and 13th, which may be termed the **Heptadic theory**.

In the tetradic and pentadic theories, the chromatic element is regarded chiefly from the melodic standpoint; in the heptadic (Day) theory it is regarded chiefly from the harmonic standpoint. The present treatise, in relation to the diatonic element, is based on the pentadic theory, but in relation to the chromatic element, a departure is made from the original theory, and this element is regarded chiefly from the harmonic standpoint.

THE TETRADIC THEORY

According to the tetradic theory, chord construction is confined to the limits of an octave; pentads, therefore, are unavailable, and consequently, unrecognized. Chords known as pentads in the other theories, are known under other names in this theory, the ninth being regarded as an unessential dissonance — a suspension or an auxiliary note. Chromatic chords are formed, almost exclusively, upon the principle of chromatically altering the notes of diatonic chords; when otherwise, they are regarded as borrowed chords.

On first thought it might appear reasonable to argue that the tetradic theory is above criticism, for, since the tonal material of music is comprised within the limits of an octave, and since one octave, except in the matter of pitch alone, is identically the same as another, so every chord in music may presumably be obtained within this restricted sphere.

On second thought, however, it will be found that there are some valid objections to this theory in connection with both the diatonic and the chromatic elements.

The restriction of music to the limits of an octave is not justified either by nature or by art. The human voice, for example,

is by no means limited to an octave; and the harmonic chord of nature, the scientific basis of chord construction, extends over an unlimited number of octaves. While, in art, the suspension 9 to 8, one of the most frequently employed discords, is, of course, impracticable, without exceeding such narrow confines. Furthermore, the various octaves in themselves are not of equal value from the harmonic standpoint, for, a chord which is acceptable in one octave may be intolerable in another; compare, for example, the lower octaves on the pianoforte with those in the middle of the instrument.

Wherefore, no apparent purpose is served, and no material advantage obtained, by this limitation in chord construction.

The theory of octave limitation precludes, of course, the formation of pentads; but the non-recognition of these chords is in the light of a retrogression in the development of harmony, for, from an historical standpoint, pentads were accepted *before* they were rejected. That the ninth is frequently treated as a suspension or an auxiliary note, is not a sufficient reason for rejecting the chord, for, the chord *may* be, and frequently is, employed as an independent discord, as a chord of *motion*, each of its constituent notes proceeding to a note of the tonic chord—the chord of *rest*.

In regard to the derivatives of pentads, the tetradic theory of harmony is very defective. The chord of the leading-seventh, for example, is not regarded as a dominant discord, notwithstanding that it naturally resolves upon the tonic chord; while the leading-note is regarded as the absolute root of the chord. That the leading seventh is a dominant discord, however, may be readily proved. For, the first inversion of the *triad* on the leading-note, when it resolves upon the tonic chord, is a dominant discord, and is employed as such at the cadence in counterpoint, whenever the Canto Fermo is in the bass; this chord is, therefore, a derivative of the dominant seventh. In like manner, if a seventh be added to this triad, and the chord be resolved upon the tonic, it will still remain a dominant discord, and will, therefore, be a derivative of

the dominant ninth. The addition of the seventh does not absolutely change the whole character of a chord, it is simply an harmonic enrichment; the root is not changed thereby, and the general purpose of the chord is not affected.

Wherefore, no apparent purpose is served, and no material advantage obtained, by this rejection of chords of the ninth.

The tetradic theory, though restricted in regard to the diatonic element, is the reverse, in regard to the chromatic. Upon the principle of chromatic alteration, even the simplest concords may be converted into unreasonable discords. Nor is there let or hindrance by law or precept, in this respect, other than the general rule that the part which moves by a chromatic semitone must proceed by a diatonic semitone. Composers, it is well-known, write chromatic progressions largely upon these very lines, and, as a matter of fact, there is little if any objection to the principle, the objection lies in the fact that there is apparently no limitation to the use of chromatic notes; in this respect, good taste, — a variable quality on the part of the average student, — alone determines where the lines must be drawn. The following example illustrates the principle of chromatic alteration as applied to the triad of *C* major.

Ex. 1



The triad at (*a*) is converted into a minor triad at (*b*), into an augmented triad at (*c*), and into a diminished triad at (*d*). Of the *G* flat in the triad at (*d*), it may be said that this note is of very rare occurrence in the key of *C*, and students would be well advised not to employ it at all; and the same remark may be applied to the anomalous triad at (*e*). The diminished triad on the chromatically raised root, at (*f*), is practicable, and this triad together with those at (*b*), (*c*), (*d*) and (*e*), will all be considered in the present volume. The triads at (*g*) and (*h*) can only

ployed as chromatic fortuitous chords, for, perfect intervals must not be employed under other names in chord construction; the triad at (*g*) contains an augmented third, and that at (*h*) a doubly diminished fifth, both of these intervals being the enharmonic equivalents of a perfect fourth. The triads at (*i*) and (*j*) are, in a word, *unmusical*; it is one of the first laws in music that no note of a diatonic scale may be enharmonically changed under any conditions, unless it be for the purpose of modulation, in which case, of course, it is no longer a note of the scale under consideration. The chromatic changes exemplified in these particular triads — (*i*) and (*j*) — simply lead to unbridled license on the part of the student; they are not to be found in the works of the great classical composers, and they do not tend to elevate the art.

Wherefore, no apparent purpose is served, and no material advantage obtained, by this extravagance in chromatic alteration. Wherefore, also, the tetradic theory, as a theory, fails to fulfil the requirements of modern harmony.

THE PENTADIC THEORY

The *original* pentadic theory has been explained in Parts I and II of the present treatise; it need only be added here that the chromatic element in this theory is practically the same as that in the tetradic theory, and it is, therefore, open to similar objections. The chromatic element in the *modern* pentadic theory, as adopted in the present volume, will be duly explained after some reference has been made to the work accomplished by Dr. Day in the cause of Harmony.

THE HEPTADIC THEORY

“Alfred Day, M.D., the author of an important theory of harmony, was born in London, in January, 1810. In accordance with the wishes of his father, he studied in London and Paris for the medical profession, and, after taking a degree at Heidelberg, practised in London as a homœopathist. His father's want of sympathy for his musical inclinations in his earlier years having prevented him from attaining a suffi-

cient degree of practical skill in the art, he turned his attention to the study of its principles, and formed the idea of making a consistent and complete theory of Harmony, to replace the chaos of isolated rules and exceptions, founded chiefly on irregular observation of the practice of great composers, which, till comparatively lately, was all that in reality supplied the place of system. He took some years in maturing his theory, and published it finally in 1845, three years only before his death, February 11, 1849." *

Dr. Day's theory, even before his work on Harmony was published, was endorsed by Sir George Macfarren (1813-1887), who, in 1860, published his own work, entitled, "The Rudiments of Harmony," in which he not only advocated, but also somewhat further developed, the principles originated by Dr. Day. Macfarren succeeded Sir Sterndale Bennet as Professor of Music at Cambridge in 1875, in the following year became principal of the Royal Academy of Music, and, in recognition of his services in the cause of music, was knighted in 1883. With such a champion, the Day theories were rapidly promulgated, and before the end of the nineteenth century many eminent theorists in both Europe and America had adopted the same, had taught the same to their pupils, and had written further treatises upon the same. Yet, notwithstanding its numerous adherents, since, theorists equally eminent, have refused to accept the Day theory, it may be assumed, that, up to a certain point, this theory must be logical, and the arguments conclusive, but that beyond this point, it and they give rise to diversity of opinion.

Dr. Day divides the subject of Harmony into two distinct parts, namely, (1) the Diatonic or strict, and (2) the Chromatic or free; each part is treated independently of the other, but they are united, as it were, by a chapter on what he terms, Diatonic free harmony. Since the principles enunciated in Part I have not been adopted, so far as any original treatment of the subject is concerned, by any of his successors, and since they have practically no bearing on the subject under consideration, namely, the

* From the article "Day" in Grove's Dictionary.

chromatic element in music, it will not be necessary to devote any attention to them. It is in his treatment of "Chromatic harmony, or harmony in the free style," as he calls it, that Dr. Day's reputation was established.

"His explanation of the chromatic system was quite new, and his prefatory remarks so well explain his principles that they may be fitly quoted. After pointing out that the laws of diatonic harmony had been so stretched to apply them to modern styles that they seemed 'utterly opposed to practice,' he proceeds: 'Diatonic discords require preparation because they are unnatural; chromatic do not because they may be said to be already prepared by nature'—since the harmonics of a root note give the notes which form with it the combinations he calls fundamental discords. 'The harmonics from any given note are a major third, perfect fifth, minor seventh, minor or major ninth, eleventh, and minor or major thirteenth.' And this series gives the complete category of the fundamental chords of Day's chromatic system. Moreover, with the view of simplifying the tonal development of music, and giving a larger scope to the basis of a single key — and, thereby, avoiding the consideration of innumerable short transitions — he gives a number of chromatic chords as belonging essentially to every key, though their signatures may not be sufficient to supply them, and with the same object builds his fundamental discords on the basis of the supertonic and tonic as well as on the dominant. In respect of this he says: 'The reason why the tonic, dominant, and supertonic are chosen for roots is, because the harmonics in nature rise in the same manner; first the harmonics of any given note, then those of its fifth or dominant, then those of the fifth of that dominant, being the second or supertonic of the original note. The reason why the harmonics of the next fifth are not used is, because that note itself is not a note of the diatonic scale, being a little too sharp (as the fifth of the supertonic), and can only be used as a part of a chromatic chord.' The advantages of this system of taking a number of chromatic chords under the head of one key, will be obvious to any one who wishes for a complete theory to analyse the progressions of keys in modern music as well as their harmonic structure. For instance, even in the early 'Sonata Pathétique' of Beethoven, under a less comprehensive system, it would be held that, in the first bar, there was a transition from the original key of C minor to G; whereas under this system the first modu-

lation would be held to take place in the fourth bar, to *E* flat, which is far more logical and systematic.”*

From this extended quotation it will be seen that Dr. Day advocates the formation of a chord upon the dominant consisting of a series of super-imposed thirds, and comprising every note in both the major and minor mode; this chord, known as the dominant thirteenth, may be employed in the following four different forms:



(a) With the major ninth and major thirteenth, (b) with the minor ninth and minor thirteenth, (c) with the ninth major and thirteenth minor, and (d) with the ninth minor and the thirteenth major.

It is not to be supposed that all the notes of these gigantic chords were intended to be sounded simultaneously, although such a discord might, under certain conditions, be possible; the special use of these chords was, apparently, in connection with the analysis of chords. The *convenience* of the system is most patent, for, since the chord at (a), for example, contains all the notes of the major diatonic scale, so *every* diatonic chord might be regarded as a more or less incomplete form of this chord, and, therefore, could be readily explained.

Chords of the ninth, eleventh, and thirteenth, it may here be said, are mentioned in the work on Harmony by Albrechtsberger, (1736-1809), but the chords in this case are formed by adding a third, a fifth, and a seventh, respectively, *below* a chord of the seventh. The

* From the afore-mentioned article

idea of adding another third above a chord of the ninth, so forming a chord of the eleventh, and then another third, so forming a chord of the thirteenth, was, presumably, original on the part of Dr. Day.

The most important feature in the Day theory, however, is the *systematic method* in which the chromatic element in music is treated. Fundamental (or primary) sevenths on the tonic and supertonic are, for the first time in the history of music, regarded as chromatic chords; and the arguments brought forward to prove that these chords may be employed in a key without inducing a modulation, should be sufficiently convincing to every modern theorist. Chords of the major and minor ninth on the tonic and supertonic are next considered. The chord of the eleventh on these notes is forbidden by Dr. Day: "The chord of the eleventh," he says, "unlike the chords of the seventh and ninth, can only be taken on the dominant." The reason given for excluding this chord, is "because its resolution, if taken on either tonic or supertonic, would be out of the key." Finally, the chords of the thirteenth on the tonic and supertonic, the ninth and thirteenth being either major or minor, as in the case of the dominant thirteenth, are considered.

Although Dr. Day excluded the eleventh from the tonic and supertonic thirteenths, and notwithstanding that Macfarren endorses this particular feature of the theory, yet more modern authors have not only included the eleventh in these chords, but have also advocated the use of the chords of the tonic and supertonic eleventh.

The three chords of the thirteenth in their complete forms may be exhibited thus:

Ex. 3



These chords, having once been established, became the harmonic basis of the chromatic scale which Dr. Day adopted, and which has since become known as the harmonic form of the chromatic scale. But, it may be said, so far as this scale itself is concerned, that it is obtainable from the chords of the minor ninth on the tonic, dominant and supertonic, without any reference to the elevenths or thirteenth.

Mention may be made of Dr. Day's valuable arguments on the difference between the diatonic and chromatic semitone. He conclusively proves that, theoretically, the diatonic semitone is the larger of the two, in other words, that the interval *C* to *D* flat is slightly greater, from the standpoint of acoustics, than the interval *C* to *C* sharp. This point, however, is of no practical importance in connection with Harmony, for, according to the laws of equal temperament, these semitones are identically the same in point of size; they differ only in notation and use.

Reference should also be made to one particular chord which is considered under the heading of the dominant eleventh, namely, the chord generally known as the "Added sixth." This chord is claimed to be the third inversion of the dominant eleventh, the root and third of which are, of course, omitted.

After the treatment of the fundamental discords has been exhausted, Dr. Day next considers the chords of the Augmented sixth. For these chords, probably for the first time in the history of music, a double root is claimed. The bass-note of the following chords, for example, is regarded as a primary harmonic of the generator *G*, the dominant, while the upper notes are regarded as

Ex. 4

(a)	(b)	(c)
Italian	French	German

primary harmonics of the generator *D*, and, therefore, as secondary harmonics of *G*. By secondary harmonic is understood a note generated from one of the harmonics of a given generator. Dr. Day states that the interval of the augmented sixth "should not be inverted, because the upper note, being a secondary harmonic *and capable of belonging only to the secondary root*, should not be beneath the lower, *which can only belong to the primary root*." The three forms of this chord may occur, not only on the minor submediant, as exemplified in Ex. 4, but, also, on the minor supertonic; in the latter case the tonic and dominant are the roots.

The chromatic element in music is finally considered in connection with "Passing notes in the free style," when, in certain cases, the necessity for the use of the melodic form of the chromatic scale, which has hitherto been excluded, is recognized. After which a chapter on enharmonic modulation brings this unique treatise on Harmony to a conclusion.

On first thought it might appear reasonable to argue that the heptadic theory is above criticism; in the first place because it is founded upon a system, and surely some system is preferable to none at all; and, in the second place, because it is a convenient theory; convenient, because the dominant thirteenth comprises all the notes of the diatonic scale, so that any and every diatonic chord may presumably be explained, and, convenient, because the three fundamental discords comprise the notes of a complete chromatic scale, so that any and every chromatic chord may, presumably, be explained.

On second thought, however, it will be found that there are some valid objections to the heptadic theory, in connection with both the diatonic and the chromatic elements.

With regard to the chord of the eleventh, it may be said that even Dr. Day himself apparently regards this chord in the light of a stepping stone to the chord of the thirteenth, for, in the case of the tonic and supertonic fundamental discords, the use of the eleventh is forbidden, notwithstanding that the thirteenth is regarded as an essential note. The principal use of the dominant

eleventh, according to Dr. Day, seems to be in connection with the above-mentioned much abused chord of the "Added sixth," which, as was said above, he regards as the dominant eleventh with the dominant and the leading-note omitted; reminding one of the play of *Hamlet*, with Hamlet and Ophelia omitted! And, if this kind of analysis can be defended, then why should not the tonic chord be called "the fifth inversion of the dominant thirteenth?" According to the tetradic theory, the root of this chord is the supertonic, but Helmholtz, the great German philosopher, and Rameau, a noted French author, both claim the subdominant as the root of this chord. The mystery surrounding the chord is probably attributable to the fact that there are *two* chords consisting of identically the same notes, one of which naturally resolves upon the tonic chord, while the other naturally resolves upon the dominant. (Part II, Chap. XII.)

Ex. 5

(a) * (b)

(c)

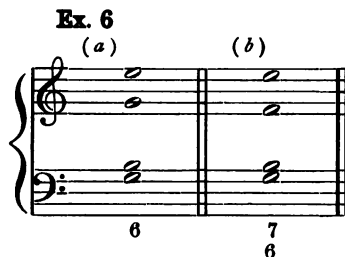
The chord marked * in Ex. 5 (a), is the "Added sixth," and its resolution upon the tonic chord constitutes a variation of

the plagal cadence. This chord is really a subdominant triad, to which a sixth is added, hence the name; the *sixth* is, therefore, the *dissonant* note, and the chord may be regarded as a *diatonic modification*. The sixth is frequently introduced as a passing note, as at (b), when it is very evident that the root of the chord is the subdominant. According to the Day theory this chord is a dominant eleventh, *G* being the root; but as the root and third are omitted the seventh and ninth become consonant intervals, while, of course, *D* — the sixth — is also consonant.

The chord marked * in Ex. 5 (c), is the first inversion of a secondary tetrad on the supertonic; the *fifth*, therefore, is now the dissonant note, and, as such, it is prepared and resolved in the usual manner. The whole passage is a sequence of secondary sevenths, a dominant sequence, that is to say, the roots rise a fourth or fall a fifth, consequently the root of this chord is *D*; *F*, in this case, could not be the root. According to the Day theory *G* is the root not only of this chord but also of all the other tetrads in this passage, with the result that consonances become dissonances, and dissonances, consonances; and the theory, whether it be regarded as convenient or anything else, becomes contrary, illogical, and inconsistent.

With regard to the chord of the thirteenth, though, at first sight, it may appear *convenient* to be able to call any chord by this name, which cannot be satisfactorily explained in any other way, yet, since there are so many possible combinations of the notes of this chord, the name — dominant thirteenth — becomes *indefinite*, and especially is this the case, when it is remembered that the dominant minor thirteenth (with minor ninth) is available for use in the major mode. Dr. Day furnishes no less than *seventy* different examples of the use of this chord, some in four-part and some in five-part harmony, many of the latter being of an extremely harsh character. Each of these examples is accompanied with one or more rules, to which there are sometimes exceptions, so that the whole chapter results in a mass of complications leading to "confusion worse confounded."

Two forms of this chord may be briefly considered, that at (a), — Ex. 6 — which comprises the dominant with its third and thirteenth, and that at (b) which is the same chord with the seventh included.



The chord at (a) is figured 6, and the name "dominant sixth" is, therefore, just as applicable and quite as justifiable as the name "dominant thirteenth." This chord is figured $\overset{13}{6}$ by Macfarren, but it is not customary in figured basses to employ any figure higher than the number 9, that is to say, any double figures at all. The dominant sixth, must not be confused with the first inversion of the mediant triad; the latter chord is rarely employed except in sequences, while the former is of common occurrence.

The chord at (b),—Ex. 6—is figured $\overset{7}{6}$, and this is the chord, the one chord, to which reference is almost invariably made when the term "dominant thirteenth" is employed; the name "dominant sixth and seventh," however, is *more definite*, for it exactly describes this particular chord, whereas "dominant thirteenth" is employed for a great number (sixty-nine?) of other chords.

Upon the treatment of this chord —Ex. 6, (b),— depends entirely the question as to whether or not it should have a distinctive name. When, as in Ex. 7, the treble note is either preceded as at (a), or followed as at (b), by the note below, that is to say, by the fifth of the root, the chord is simply a dominant seventh, with the sixth introduced ornamentally as an auxiliary note; at (a) the sixth is employed as a free turning note; at (b) the fifth is temporarily displaced, the sixth being either a suspension or an accented auxiliary note. When the fifth is not introduced at all,

that is to say, when the fifth is absolutely displaced (as in Ex. 6), then a distinctive name is desirable, and a definite name is preferable to an indefinite name in this and in all cases.

Ex. 7

(a) (b)

These chords —Ex. 6 (a) and (b)— are equally available for use in the minor mode, when the sixth, which is almost invariably placed in the treble, becomes a minor interval. The general treatment of the chords is the same, whether the mode is major or minor. The natural resolution of the dominant sixth and seventh is shown in Ex. 8; (a), in the major mode, and (b), in the minor.

Ex. 8

(a) (b)

The following chords, which, it will be seen, are identically the same on the piano, must now be considered. According to

Ex. 9
(a) (b)

7 7
#5 b6

Dr. Day, these chords are not only identically the same from an instrumental standpoint, but they are also identically the same in name and in effect; and this *may be said to be the crucial point in the Day theory*. The names, "dominant eleventh and thirteenth" can at least be tolerated, but when Dr. Day claims that an augmented fifth, a dissonant interval, is identically the same as a minor sixth, a consonant interval, it can readily be seen why so many eminent musicians have rejected his theory. Dr. Day, moreover, does not stop at this point; he states and claims that whenever the chord at (a) — Ex. 9 — is employed, the composer — whosoever he may be — is guilty of *false notation*, in other words, has written an incorrect note. It is truly a convenient theory, for it is certainly a matter of much convenience, when a progression occurs which is not in accordance with the principles of the theory, to be able to qualm the conscience by saying that the composer is wrong; but, if musical works are to be judged and analysed on these lines, it will be found that all the great composers are systematically wrong in their use of certain chromatic notes, namely, the hypertonc, the hyper-supertonc (the note employed in the present instance) and the hyper-dominant.— The prefix "hyper" here indicates "chromatically" raised. (See Appendix I, Part I.)

It was stated above that Dr. Day drew a line of distinction between the diatonic and the chromatic semitone, claiming that the latter was theoretically smaller than the former; admitting this to be the case from the standpoint of acoustics, the diatonic

semitone being in the ratio of 15 : 16, and the chromatic, 24 : 25, he might at least have credited the great composers with recognizing the same difference, and might have granted them the privilege of employing that one which, for the time being, appealed to their emotions. This privilege, however, is emphatically denied, and the theory, therefore, contradicts itself; *it accepts the difference but rejects the distinction.*

Reverting now to the chords in Ex. 9, it may be said that the augmented fifth of the dominant in the major mode, and the minor sixth of the dominant in the minor mode, are often introduced ornamentally in connection with the perfect cadence, as shown in the following example:

Ex. 10

(a) (b)

The musical notation for Example 10 consists of two measures, (a) and (b), each with a treble and bass staff. In measure (a), the treble staff shows a D# note followed by an E note, and the bass staff shows a 7-5-#5 progression. In measure (b), the treble staff shows a D note followed by an E note, and the bass staff shows a 7-5-6 progression. The notes are written in a style that suggests a specific tuning or temperament, with the D# and E notes being identical in pitch.

At (a) — Ex. 10 — the fifth of the dominant (in the treble) is followed by a chromatic semitone; at (b), it is followed by a diatonic semitone. In each case the natural resolution of the chord is given; without the resolution, the emotional effect of the semitone would not be obtained. Let each of these progressions be played slowly, two or three times, on the piano, and, notwithstanding the fact that the *D* sharp and the *E* flat are identically the same in pitch, it will be found that a difference in effect is clearly discernible; an æsthetic difference, the augmented fifth of the root — the hypersupertonic — is tinged with *joy*, while the minor sixth of the root — the minor mediant — is tinged with *sorrow*. According to the Day theory, the *D* sharp is false notation, the note should be

E flat in each case. Musical notation may be defined as the art of transcribing to paper the effect of musical sounds; and this effect is as readily appreciated with the eye as with the ear by the true musician. If, therefore, the above progressions differ from one another when played on the piano, then they should be *notated* differently when transcribed to paper. Beethoven, it is well known, composed his greatest works whilst suffering from total deafness; he, through the eye alone, was able to appreciate the majestic harmonies of the "Choral Symphony." Wherefore, it is a reflection upon the genius of the great composers, to state that they wrote one thing but intended another, or to claim that they heedlessly or needlessly sacrificed correct notation for convenient notation.

Now, the notes *D* sharp and *E* flat, instead of being introduced *after* the dominant chord, may be employed *in* the dominant chord, in the treble, in place of the fifth of the root, which thus becomes absolutely displaced, as shown in Ex. 9. The chord at (a) thus becomes a chromatic modification, and the chord at (b), a diatonic modification, but the resolution is the same, and the resultant effect practically the same, as when the notes *D* sharp and *E* flat are introduced ornamentally, as in Ex. 10. They are, therefore, two entirely different chords, they naturally belong to two different keys (*C* major and *C* minor), and, moreover, they must have two different names. Their names, respectively, are "the dominant augmented fifth and seventh," and "the dominant minor sixth and seventh," names, which may not be as convenient as the name "dominant thirteenth," but which at least possess the merit of definitely determining the character of the chord, a feature far more desirable than that of indefinite convenience.

With regard to Dr. Day's statement that the interval of the augmented sixth cannot be inverted, it need only be said that this statement is not in accordance with facts, for the third inversion of the German sixth, when the interval is, of course, inverted, has been employed by the best composers.

Dr. Day's statement with regard to the fifth of the super-tonic, which he claims is not a note of the diatonic scale, being "a little too sharp," may be and is perfectly true from the standpoint of acoustics, but, in his endeavors to establish a principle, he overlooks one very important point, namely, that *acoustics and equal temperament are by no means one and the same thing*. Acoustics is the basis of the *science* of music, but equal temperament is the basis of the *art*. *B* flat, for example, as the minor seventh of *C*, is also out of tune (again a little too sharp), with *B* flat the seventh harmonic of the generator *C*, nevertheless it is the *out-of-tune* note which is employed in equal temperament; while, even the major third of art is not *perfectly* in tune with the major third of nature.

Another illustration of this point will be seen in *the major and minor tones*. The interval between the first and second degrees of the major scale, is a major tone, with the vibration ratio of 8 to 9, while the interval between the second and third degrees is a minor tone, with the ratio of 9 to 10. Now, the first and second degrees in the key of *D*, for example, are exactly the same, *according to the laws of equal temperament*, as the second and third degrees in the key of *C*; wherefore, if the note *D* has, say, 288 vibrations, then the note *E*, in the key of *D*, will have 324 vibrations, whereas in the key of *C* this selfsame note, *E*, will have only 320 vibrations. Theoretically, this is a fact, practically, it is absurd. The difference between theory and practice in this and in similar instances, may be explained on the grounds, that *the demands of equality in art have necessitated the sacrifice of inequality in science*. Even supposing that the violinist and the vocalist can exemplify the difference between the major and the minor tone, the effect would not be in accordance with the principles upon which the modern major diatonic scale is constructed, for the fundamental principle of this construction is equal temperament.

Equal temperament may be defined as the division of the octave into twelve exactly equal semitones. These semitones constitute a chromatic scale, seven of the semitones being diatonic,

and five chromatic; but, whether diatonic or chromatic, they are all *mathematically* equal. It follows, therefore, that *all the perfect fifths* will also be equal, and equal in every respect; for, it is upon this very principle of equality that the modern system of scale construction is based, every new scale being the exact counterpart of the last, exact in every particular except that of pitch alone. Wherefore, Dr. Day's statement, that one of these perfect fifths is out of tune, is erroneous.

In the old meantone, or unequal temperament system, the semitones were not all equal, and, consequently, the perfect fifths were not all equal, with the result that certain keys, called "wolves," could not be employed at all. Johann Sebastian Bach, however, struck the death blow to this system in the "Wohltemperirtes Klavier," in which there are two preludes and fugues in every key; and, after his death (1750), the old system gradually passed away, and the modern or equal temperament became, and has since remained, the definitely established system.

In the equal temperament system the perfect fifths are tempered (hence the name), that is to say, tuned slightly flat; but so slight is this flatness that the human ear can scarcely appreciate the difference between the tempered and the natural fifth. To be exact, the tempered fifth is $\frac{1}{11}$ of a comma flatter than the natural fifth; and a comma (the name for the difference between a major and a minor tone) is about $\frac{1}{5}$ of a diatonic semitone. This tempering, which is the basis of the art of piano-forte tuning, is indispensable for the purposes of harmony, and equal temperament alone enables the composer to write in any and in every key, and to modulate to or from any key by means of enharmonic changes.

There are, therefore, now no "wolves," and no fifths "a little too sharp," and no difference between the diatonic and the chromatic semitone; wherefore, the primary minor ninth on the submediant, the mediant and the leading-note may be taken for the purpose of extending the principles of the chromatic element beyond the inconvenient and illogical limitations of the Day theory.

It is unnecessary to consider other points in this remarkable theory, sufficient has been said to show that it does not furnish a satisfactory explanation of certain chromatic chords, and, consequently, it fails to furnish the correct chromatic material at the command of the composer. As a theory, so far as chords of the ninth are concerned, and these in relation to the tonic, the dominant and the supertonic, as roots or generators, it holds good for the *minor* or artificial mode only; when applied to the major or natural mode it is woefully deficient. The whole question may be summed up thus: if the Day theory of the chromatic element in music is correct, then the principles upon which chromatic progressions have been written by the greatest exponents of the art of music, are incorrect, and, *ex necessitate rei*, the converse must hold good.

The chief defects of the Day theory may be briefly summarized as follows:—

(1) It was altogether *unknown* to the great classical masters of the *Bach* to *Beethoven* period (and even later); indeed, it frequently happens that chords employed by these composers cannot be explained by the Day theory, in which case the chords are said to be written in *False notation*.

(2) The *compound* intervals of the eleventh and thirteenth being represented in figured basses by their *simple* forms—the fourth and sixth, the names “*dominant fourth and dominant sixth*” are more applicable and quite as justifiable as the names “*dominant eleventh and thirteenth*.”

(3) These names, furthermore, are *indefinite*. Dr. Day furnishes *thirty-two* different examples of the use of the dominant eleventh, and as many as *seventy* different examples of the use of the dominant thirteenth.

(4) The theory completely overthrows the generally accepted theory of *roots*, and, consequently, *root progressions*, for any diatonic triad or chord of the seventh may be regarded as an *incomplete form* of the dominant thirteenth.

(5) The *harmonic form of the chromatic scale* being the basis

of this theory, and this scale being derivable from the chords of the *ninth* on the tonic, dominant, and supertonic, *nothing is gained* by adding the eleventh and thirteenth to these generators.

(6) It is founded (as has been shown above) upon a false estimate of the true significance of *equal temperament*, in which, for the purpose of enharmonic changes, all the semitones—whether diatonic or chromatic—must be regarded as being *absolutely equal*.

(7) Finally, when applied to the works of the great modern composers—Wagner, and his contemporaries and successors, this theory *signally fails*, for, in the chromatic extensions of the modes now in vogue, a primary seventh (to mention one chord alone) may be employed not only upon the tonic, the dominant and the supertonic—as advocated by Dr. Day—but, also, upon *all the degrees* of the major scale.

The chief features in the tetradic theory, to which heptadic theorists object, are *diatonic restriction* and *chromatic extravagance*, while the chief features in the heptadic theory, to which tetradic theorists object, are *diatonic extravagance* and *chromatic restriction*. Were either of these theories perfect, the other would cease to exist. That there are good features in both cannot be denied, and a “happy medium,” retaining the good and eliminating the bad, is surely a consummation devoutly to be wished.

THE MODERN ENHARMONIC SCALE

The enharmonic theory of the chromatic element in music—the modern pentadic theory—has been evolved on a logical basis from a natural source, and has been developed with the express object of extending the restricted features, and avoiding the extravagant features, of the other theories. This theory has been in use since the commencement of the present century, and is, therefore, neither a new venture nor an untried experiment. It is being advanced with the conscientious endeavor to offer a

solution to certain theoretical difficulties which, for many generations, have hampered the science of harmony.

Just as the diatonic scales comprise the tonal material of diatonic chords, so the chromatic scale, which, as will be duly shown, is the logical extension of the major diatonic scale, comprises the complete—both the diatonic and the chromatic—material of a key. Diatonic notes may be obtained from a series of rising perfect fifths, beginning with the flattest and ending with the sharpest notes of a key: thus, the diatonic key of *C* major may be represented by the notes:—

F C G D A E B

and the chromatic notes of the key of *C* may be obtained by extending this series on either side, as follows:

Subdominant Chromatics	Diatonics	Dominant Chromatics
<i>G♭ D♭ A♭ E♭ B♭</i>	<i>F C G D A E B</i>	<i>F♯ C♯ G♯ D♯ A♯</i>

To extend the above series any further, on either side, would interfere with the integrity of the diatonic scale, for, the *C* flat on the one side, and the *E* sharp on the other, are the enharmonic equivalents of the sharpest and flattest notes, respectively, in the key of *C*.

From the standpoint of their tonal significance the chromatic notes are divisible into three classes, namely, the perfect, the imperfect, and the extreme.

The perfect chromatics in the key of *C* are *F* sharp and *B* flat, notes that are diatonic to the attendant major keys.

The imperfect chromatics are *C* sharp, *D* sharp and *G* sharp (the leading-notes of the three relative minor keys) together with their enharmonic equivalents, *D* flat, *E* flat and *A* flat (notes obtained from the affinitive minor keys).

The extreme chromatics are *G* flat and *A* sharp, the enharmonics of the perfect chromatics, and notes of but little harmonic relationship with the key of *C*, for, they occur in no scale in close relationship with the key of *C*.

From the above table it will be seen that the perfect chro-

matics are obtained first, the imperfect chromatics next, and the extreme chromatics last; and that they occur in regular order alike on both the flat side (subdominant series) and the sharp side (dominant series) of the diatonic notes. The following example, the symmetrical construction of which is a noticeable feature, illustrates the purpose of the above table, and comprises, therefore, the complete tonal material, both diatonic and chromatic, of the key of C:—

Ex. 11

Chromatic

Extreme : Imperfect Perfect

Diatonic

Chromatic

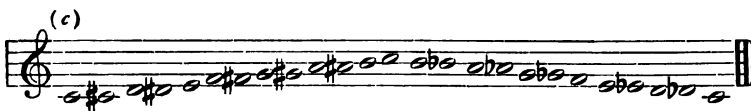
Perfect Imperfect : Extreme

And from the notes comprised in the above example the chromatic scale of C is obtained. Three distinct forms of this scale are in use at the present day, the notation of which is as follows:—

Ex. 12

(a)

(b)



The scale at (a),— Ex. 12— commonly called the harmonic form, is the chromatic scale of the heptadic theory. This scale, which comprises twelve notes, is employed in connection with the minor mode, and it will, therefore, be known as *the minor chromatic scale*. It is too restricted for use in connection with the major mode.

The scale at (b), commonly called the melodic form, is the chromatic scale of the pentadic theory, as advocated in the present treatise. This scale, which comprises fifteen notes, is employed in connection with the major mode, and it will, therefore, be known as *the major chromatic scale*. It is too extravagant for use in connection with the minor mode.

The scale at (c), sometimes called the instrumental form, is the chromatic scale of the tetradic theory. This scale, which comprises seventeen notes, includes all the chromatic notes in connection with the key of C, and it will, therefore, be known as *the extreme chromatic scale*.

The term "harmonic," if applied at all to these scales, is equally applicable to both the major and minor forms, the former, as well as the latter, being derived (as will be duly shown) from fundamental primary discords, and, at the same time, constituting the harmonic source of chromatic chords. The extreme chromatic scale is really the only one of these scales to which the term "melodic" should be applied.

The notation of the minor scale, it will be seen, is the same descending as ascending. The notation of the major scale is the same descending as the minor, but in ascending it differs in respect to three of the chromatic notes. The notation of the extreme chromatic scale may be regarded as the result of the simple plan, previously mentioned, and frequently adopted by composers, of forming the chromatic notes by accidentally raising diatonic notes

in ascending, and by accidentally lowering them in descending, in order to reduce as much as possible, the number of absolutely necessary accidentals. Similar scales may be formed from any other key-note, but it is necessary to employ identically the same intervals in relation to the key-note as are employed in the above scales. The chromatic notes in the major scale, which include those in the minor, may also be regarded as borrowed notes; the source from which they are borrowed will be considered in due course.

The minor chromatic scale is very rarely employed for ascending passages by the great composers; they almost invariably employ the major, or even the extreme chromatic scale. In the *Fantasia in D minor*, by Mozart, and the *Concerto in G*, by Beethoven, use is made of the minor form for ascending chromatic passages, but these very isolated examples simply prove that the great masters were acquainted with this form of the scale; while the constant use of the major chromatic scale proves their predilection for this form of the scale.

The major chromatic scale, in the past, has been more or less ignored, its place having been usurped by either the minor form, at the hands of heptadic theorists, or by the extreme form, at the hands of tetradic theorists, but that it is the "happy medium" between these two forms, and that its claims for recognition as the basis of the chromatic element in the major or natural scale are amply justified and can be fully substantiated, it will be the province of this treatise to prove.

In the first place, this scale, the major chromatic, for convenience, in order to avoid the necessity of writing any of the notes more than once, may be notated in the following manner, when it will be known as

Ex. 13

The Modern Enharmonic Scale



The term "modern," as applied to this scale, is employed to distinguish it from the ancient enharmonic scale of the Greeks, and to distinguish it also from the weird unmusical scale, containing intervals smaller than a semitone, which may be performed upon the violin or by the voice. The term "enharmonic" is employed to designate a scale comprising certain notes, the pitch of which may be represented by two different names. The notation of this scale is applicable to the key of C major only; by transposition, however, it may be employed as the harmonic basis of any other major key.

The natural or scientific origin of chromatic notes, as explained above, is applicable to all three forms of the chromatic scale, but to the modern enharmonic scale appertains also both a *harmonic* and a *melodic* origin, neither of which is applicable to the other forms as the basis of chromatic chords in the major mode. The harmonic origin is to be found in a series of primary minor pentads; the melodic origin is to be found in the associated scales.

**The harmonic
origin of the
Modern
Enharmonic
Scale**

In the fourth, fifth and sixth harmonics of a given generator is to be found the origin of the major triad — the common chord of nature (§ 34, Part I), and the major and minor thirds which compose this chord, constitute the basis of all chords. Having obtained one major triad, two attendant major triads are formed, one of which has for its root the fifth of the given chord, while the other has for its fifth the root of the given chord; in these three chords, known as the primary triads of the key, are to be found the notes of the major diatonic scale. The notes thus obtained from nature, are tempered, or tuned, for the purposes of art, in order that all the semitones may be exactly equal, so that any note may be taken as a key-note. The major scale is divisible into two similarly constructed tetrachords, and by means of these tetrachords the attendant major scales are formed, and then their attendants, and so on, until a major scale is formed on every possible note.

Unlike the major, the minor common chord is not derived from the harmonics of a given generator; the major triad is *natural*,

but the minor is *artificial*. The minor triad is obtained from the major triad, and it may be formed by two entirely different methods, the one, diatonic, the other, chromatic. The diatonic, or relative minor triad, is obtained by placing a minor third *below* the given major third, thus reversing the order of nature; the chromatic, or affinitive minor triad, is obtained by accidentally lowering the third of a major triad, thereby making it minor, and at the same time making the upper third major.

The argument, advanced by Ouseley,* that the minor triad is obtainable from the same generator as the major triad is not satisfactory. His contention that the notes of the minor triad occur as Nos. 16, 19 and 24, in the harmonic series, is open to question, for, the ratio 16 : 19 is not the same as that of 5 : 6, the generally recognized ratio of the minor third: and his attempt to meet the situation by claiming that two minor thirds must, therefore, be recognized, in no way solves the difficulty, for, there is but one major third, and there can be but one minor third also, according to the laws of equal temperament. That Nos. 10, 12 and 15, in the harmonic series, though accurately representing a minor triad, cannot be regarded as a *natural* minor triad — as Ouseley rightly states — is evident, for No. 10 is not a root. Wherefore, the minor triad is not obtained from nature.

The minor triads thus obtained, become the tonic chords of related minor scales, respectively known as the *relative* and the *affinitive* scales, the former being in diatonic, and the latter in chromatic relationship with the given major scale. The minor triad, like the major, has two attendant minor triads, and in these three triads is to be found the signature of the minor scale. The scale thus obtained, is the *normal* or ancient form of the minor scale; the seventh degree of this scale is now chromatically raised, again for the purpose of art, it then becomes a proper leading-note. The minor scale, therefore, like the minor chord, is also artificial. The scale, as *thus* obtained, is known as the harmonic form of the minor scale; the distinguishing feature of this form of the scale is the interval of an augmented second, which occurs

* See a Treatise on Harmony (Chapter V), by F. A. G. Ouseley, professor of music in the University of Oxford, 1855 - 1889.

between the sixth and seventh degrees; in order to avoid this unmelodious interval, another form of the minor scale, known as the melodic form, is frequently employed, but the harmonic is the true form of the modern minor scale. Other forms of the minor scale also exist, but as they are only in occasional use, and as they do not in any way affect the chromatic element in music, it will not be necessary to consider them in this connection.

Besides the major and minor triads, there are also the diminished and the augmented triads, the former being naturally diatonic and the latter invariably chromatic; but all four triads play an important part in the formation of chromatic chords.

The fourth, fifth, sixth and seventh harmonics of a given generator constitute a chord of the seventh, or tetrad, as it is called. When a tetrad comprises a major third, a perfect fifth and a minor seventh, as in this case, it is called a primary tetrad, to distinguish it from other chords of the seventh, known as secondary tetrads.

The fourth, fifth, sixth, seventh and ninth harmonics constitute a chord of the ninth, or pentad, as it is called; in this case, as the ninth is major, the chord is a primary major pentad. A primary minor pentad is obtained from the octave above, and comprises the eighth, tenth, twelfth, fourteenth and seventeenth harmonics.

Pentads, therefore, are justified by the harmonic chord of nature, the primal basis of all chords; but, as has already been explained, it is not expedient to continue this series of fundamental discords beyond pentads.

Diatonic notes are divided into two classes, namely, the passive (or notes of rest) and the active (or notes of motion); the former are the root, third and fifth of the tonic triad, and the latter are the third, fifth, seventh and ninth of the dominant pentad, the dominant itself being a bond of union between the two chords. The active notes are derived through the dominant, as a generator, from the tonic as an original generator, and as shown in Ex. 14, they naturally resolve upon the passive notes of the tonic chord.

Ex. 14



The eleventh and thirteenth are naturally tonic consonances and not dominant dissonances, and, moreover, when these notes are added to the dominant chord, they are treated not (like the seventh and ninth) as essentials, but as unessentials, not as "Additions," but as "Displacements;" that is to say, they take the place of, and naturally resolve upon, consonant notes of the *dominant* chord, and not (like the seventh and ninth) upon consonant notes of the *tonic* chord, except in certain cases, when they are regarded as modifications of the dominant chord. (See Chapter xxi.) Wherefore, the so-called chords of the eleventh and thirteenth will not be recognized in any shape or form, nor will they be considered further, except from a negative standpoint, in the present treatise.

A triad, a tetrad, and a pentad, may be formed upon any note of the major and minor (harmonic) scales. The pentad on the leading-note, however, on account of its extreme harshness, is of very rare occurrence.

The tetrads on the dominants of both modes are naturally primary discords; when formed upon other notes they are called secondary tetrads.

The pentads on the dominants of both modes are also naturally primary discords; when formed upon other notes they are called secondary pentads. The ninth in a secondary pentad is generally treated as a suspending note, or as an auxiliary note, in which case the chord may be regarded as a modified tetrad.

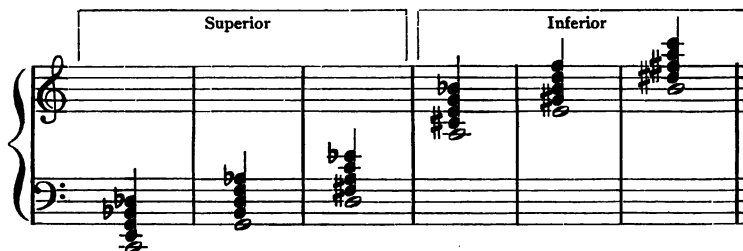
By omitting the root of a pentad, a **tetrad** is obtained, known as a derivative of the pentad; but such derivatives are obtained from primary pentads only. The derivative of a major pentad is called a minor tetrad, and that of a minor pentad, a diminished tetrad. These are the only cases in which a tetrad is known by the name of its component seventh; in all other cases a tetrad is named according to its root. These derivatives are termed *artificial* tetrads, their real root, or generator, being a major third below their nominal or apparent root. Other tetrads are termed *natural* tetrads, primary or secondary, as the case may be.

The *primary* pentads on the tonic, dominant and supertonic, are termed "the superior pentads;" those upon the submediant, the mediant and the leading-note are termed "the inferior pentads" (see Ex. 15). The latter are not employed in connection with the minor mode.

The chromatic element in music is obtained from a series of primary minor pentads, formed upon the tonic, dominant, supertonic, submediant, mediant and leading-note, that is to say, upon a series of roots rising by perfect fifths successively, in accordance with the harmonics in nature.

The harmonic origin of the modern enharmonic scale will, therefore, be found in the following series of fundamental discords.

Ex. 15



The above chords comprise the notes of the modern enharmonic scale, *no others, and none omitted*.

The whole-notes are the roots of the successive chords; the quarter-notes in each case, form a diminished tetrad. The series as a whole, it will be seen, extends over a compass of exactly four octaves, beginning and ending on the tonic of the key. The six generators occur each three times; the subdominant (the only note of the scale which is not employed in the above series) and the perfect chromatics each occur twice; while the imperfect chromatics occur once only in each form.

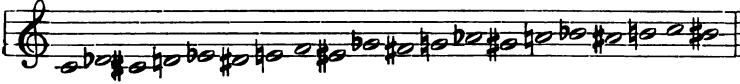
The subdominant may be regarded as the "patriarch" of the key, for, it is among the upper harmonics of this note, namely, Nos. 24, 27, 30, 32, 36, 45 and 48, that the natural scale of the tonic is found.

The extreme chromatics are not included in the modern enharmonic scale, because of their very restricted use. *G* flat, for example, cannot be employed in connection with the chord of *G*; for, every common chord possesses, to a certain degree, a tonic character, and thus the chord of *G* temporarily suggests the tonality of the key of *G*, and *F* sharp, being a diatonic note in that key, must not be enharmonically changed. *G* flat, however, may be freely employed in connection with the chord of *F*. In like manner, *A* sharp cannot be employed in connection with the chord of *F*, on account of the *B* flat in the key of *F*. *A* sharp, however, may be freely employed in connection with the chord of *G*.

The harmonic origin of the extreme chromatics is to be found in the natural extension of the above series of fundamental discords, *G* flat being obtained from the root *F*, the perfect fifth below *C*, and *A* sharp from *F* sharp, the perfect fifth above *B*, and thus a secondary harmonic of *B*.

By including the extreme chromatics, an extreme enharmonic scale may be obtained, comprising the complete chromatic material of the key; but such a scale is not to be recommended, for, the extreme chromatics are rarely, if ever, employed by the great composers, except, of course, as mere chromatic auxiliaries (Chapter xviii, Part II), and the student is, therefore, advised not to employ them at all in chord construction.

A passing reference may here be made to a modern German text-book in which the following irregular succession of notes is given as illustrating "the true pitch of the tones."

Ex. 16

The above passage, which is contrary to the first principles of scale construction, is called "the enharmonic-chromatic scale," and it is here quoted in order that no confusion may arise between this and "the modern enharmonic scale," now under consideration. The enharmonically changed diatonic notes, infringing the integrity of the natural scale, woefully exemplify the extreme chromatic extravagancies of the tetradic theory of harmony.

**The melodic
origin of
the Modern
Enharmonic
Scale**

If to the attendant scales of any given major scale, the affinitive minors of the tonic, dominant and subdominant are added, a group of scales is obtained, known as the Associated scales. These scales are recognized as the "borrowing source" for chromatic notes, for, they comprise the chromatic material of the given key.

The associated scales of *C* major are shown in the following table:—

	Subdominant	Tonic	Dominant
Major Scales	<i>F</i> major	<i>C</i> major	<i>G</i> major
Relative minors (Diatonic relationship)	<i>D</i> minor	<i>A</i> minor	<i>E</i> minor
Affinitive minors (Chromatic relationship)	<i>F</i> minor	<i>C</i> minor	<i>G</i> minor

For the purpose of comparison, these scales are shown in the following example:

Ex. 17



The above scales comprise the notes of the Modern Enharmonic Scale of C, *no others, and none omitted.*

The associated scales of C minor are shown in the following table:

	Subdominant	Tonic	Dominant
Minor Scales	<i>F</i> minor	<i>C</i> minor	<i>G</i> minor
Relative majors (Diatonic relationship)	<i>A</i> flat major	<i>E</i> flat major	<i>B</i> flat major
Affinitive majors (Chromatic relationship)	<i>F</i> major	<i>C</i> major	<i>G</i> major

For the purpose of comparison, these scales are shown in the following example:

Ex. 18



The above scales comprise the notes of the minor chromatic scale, and as no notes occur under two different names, there is no necessity for an enharmonic scale in connection with the minor mode.

The harmonic origin of the minor chromatic scale is to be found in the primary minor pentads on the tonic, dominant and supertonic.

It has been shown that the minor triad is artificial, and that the minor scale is artificial; therefore, it follows that the chromatic chords of the minor mode must differ essentially from those of the major. Furthermore, whereas in the major mode, in addition to the chords borrowed from the associated scales, there are certain extra, subordinate, chromatic chords, in the minor mode the very opposite obtains, for not only are there few, if any subordinate chromatic chords, but even some of the major and minor triads of the associated scales are not desirable for use as borrowed chords.

Such, then, are the scientific, the harmonic, and the melodic origins of the Modern Enharmonic Scale, which is here advanced and advocated as the basis of both the diatonic and the chromatic elements in music.

Innovations, of course, are ever subject to opposition. The very general sentiment that "What was good enough for my father is good enough for me" never did and never will advance either science or art. Theorists of the tetradic school may raise objections to the enharmonic theory because chords of the ninth are accepted; while theorists of the heptadic school may raise objections to it because chords of the eleventh and thirteenth are not accepted. The former, moreover, may regard the enharmonic theory as being too limited, on account of the restricted use of the extreme chromatics; while the latter may regard it from the opposite standpoint because certain chromatics, such as the hyper-tonic, etc., are recognized in the major mode.

The fact that there are two diametrically opposed theories of the chromatic element in existence, and that neither of them can subjugate the other, is, in itself, a sufficient proof that a new

theory — a happy medium — is, at least, a possibility. That certain features in both of the other theories must be discarded before the present theory can be accepted is self-evident, but these features (which have been considered above) may be summarized in a very few words, namely:

I The acceptance of chords of the ninth;

II The rejection of chords of the eleventh and thirteenth; and

III The recognition of other notes besides the tonic, dominant and supertonic, as generators.

That chords of the ninth are justified by science and art, is a point that all heptadic theorists will endorse; and that chords of the eleventh and thirteenth are not justified by either science or art, is a point that all tetradic theorists will endorse; wherefore, simply as a matter of argument, the pentadic theory may be claimed as being the happy medium between the two extremes. That the chromatic element in music has not hitherto been systematized in a consistent and comprehensive manner, is no proof that the great masters did not employ a definite system in writing chromatic progressions. The composer, like the poet, expresses thoughts in his own language. The poet does not stop to consider the derivation of a word, or to parse a sentence, neither does the composer stop to analyse a chord, or to examine the construction of a period. It is the province of the *theorist* to explain harmonic progressions. Practice comes before theory in questions appertaining to Harmony, that is to say, the laws of theory are derived by deduction from the practice of the best composers. The modern enharmonic theory is both consistent and comprehensive; and it is applicable not only to the works of the great composers of the past and the present, but it will also be applicable to those of the future, so long as the art of music is based upon the principles of equal temperament.

CHAPTER XIX

CHROMATIC CONCORDS

215. A chromatic chord may be defined as a chord which contains one or more notes foreign to the diatonic scale of the key in which it is introduced, but which does not effect a modulation.

Chromatic chords should be studied systematically, after the manner of diatonic chords, and in accordance with the following table:

I Chromatic Triads

CONCORDS, MAJOR AND MINOR.

DISCORDS, AUGMENTED AND DIMINISHED.

II Chromatic Tetrads and Pentads

PRIMARY TETRADS.

PRIMARY MAJOR PENTADS AND MINOR TETRADS.

PRIMARY MINOR PENTADS AND DIMINISHED TETRADS.

III Chromatic Modifications

AUXILIARY DISCORDS.

CHORDS OF THE AUGMENTED FIFTH.

CHORDS OF THE AUGMENTED SIXTH.

SECONDARY TETRADS, ETC.

In the present chapter, chromatic concords will alone be considered: (1) the major and minor triads of the major mode, and (2) the major and minor triads of the minor mode.

The diminished triads being regarded and treated, generally, as derivatives of primary tetrads, will be considered in Chapter XX. The augmented triads will be considered in Chapter XXIII, in connection with the subject of enharmonic modulation.

Chromatic chords are divided into two classes, namely, the **ordinate** and the **subordinate**. The ordinate chromatic chords are derived from the associated scales (p. 387), and though they may be regarded as having been employed, in the first instance,

as "borrowed" chords, yet they are now regarded as "accepted" chords, and, therefore, as part and parcel of what is understood by the term "key." The subordinate chromatic chords comprise all chords other than the diatonic and the ordinate chromatic chords.

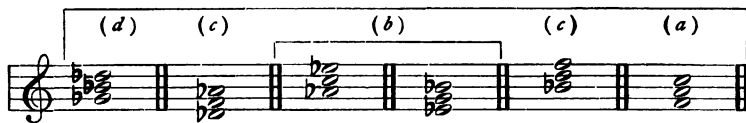
It has already been stated (p. 379) that the chromatic material of the *major mode* is to be found in the *melodic* form of the chromatic scale, and that of the *minor mode* in the *harmonic* form of the chromatic scale, these scales comprising the individual notes of the associated scales of each mode respectively; the attention of the student, therefore, should be particularly directed to the real significance of *both* forms of the chromatic scale.

To the teacher of harmony it is very apparent that some line of demarcation must be drawn between the ordinary and the extraordinary chromatic material in music. This line, in the present treatise, has been drawn very definitely between the ordinate and the subordinate chromatic chords; and the student is warned that to venture beyond this line is not only unnecessary, as may be seen from an analysis of the works of such classic masters as Bach, Mozart and Beethoven, but, from his own standpoint, it is even undesirable, for, the result might prove to be unmusical. That the modern composer regards any chord in any key as being available for use in every key, is not to the point. The object in view in the study of harmony, is to acquire a general knowledge of chord construction, and the purpose in view in a treatise on harmony is, not to dictate to the composer, but to educate the student. When the student enters the realm of composition, he will find it advisable to imitate before venturing to originate, and that in both cases the academic laws of harmony will consciously or sub-consciously be the basis of all harmonic progressions.

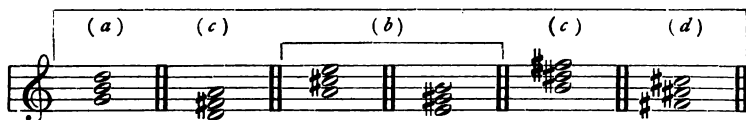
216. All major triads are related, more or less closely, to one another; and the degree of relationship between any two triads is determined by the relationship which exists between them when they occur as *tonic* chords.

The **major triads** of music, in relation to the triad of C major, are exhibited in the following example:

Subdominant Series



Dominant Series



The triads at (a), being diatonic to the key of C, are in *first* relationship with the chord of C; the triads at (b) are in *second* relationship; those at (c) in *third* relationship; the triads at (d), theoretically one and the same triad — the point in harmony where extremes meet — are in *extreme* relationship with the chord of C. The triads at (b) and (c) are ordinate chromatic triads, those at (d) subordinate chromatic triads. It will thus be seen that all the triads which occur naturally in the key of C minor are available for use in the key of C major.

The major triad, being the basis of the primary tetrad and, consequently, closely connected with its enharmonic equivalent, the German Sixth (p. 331) — one of the most important chromatic modifications — naturally plays a very significant part in chromatic harmony, and the student, therefore, should endeavor to master thoroughly its use and treatment.

The scientific origin of the chromatic material is to be found in the natural extension of the diatonic material. Each note of the major mode possesses a certain degree of what is termed "tonal intensity"; thus F (IV), in the key of C major, is the gravest (or flattest) note, and B (L) the acutest (or sharpest) note. The other notes follow in regular order, rising from IV by perfect fifths successively; wherefore, if the note F be represented by seven degrees of grave intensity, then the note C will be represented by six degrees, the note G, by five degrees, and so on, to B with one

degree. So that the note *G* is acuter than the note *C*, and *C* acuter than *F*; and the note *A* is graver than the note *E*, and *E* graver than *B*.

That IV is the gravest note in the scale will be seen from the scale of *F*, where IV is the only flat note present; and that one flat may be graver than another will be seen from the scale of *B* flat, where *E* flat (IV) is graver than *B* flat. And that L is the acutest note in the scale will be seen from the scale of *G*, where L is the only sharp note present and that one sharp may be acuter than another will be seen from the scale of *D*, where *C* sharp (L) is acuter than *F* sharp.

If, now, the diatonic series of notes be extended on either side by the addition of five notes, ascending by perfect fifths from L, and descending by perfect fifths from IV, the *complete* chromatic material of the key will be obtained. The following table exhibits these seventeen notes in the key of *C* major, with their symbols, and numbers representing their relative tonal intensity:—

Chromatic				Diatonic								Chromatic				
Ext.	Imp.											Per.	Per.	Imp.		
oV	-II	-VI	-III	VII	IV	I	V	II	VI	III	L	xIV	xI	xV	xII	xVI
G♭	D♭	A♭	E♭	B♭	F	C	G	D	A	E	B	F♯	C♯	G♯	D♯	A♯
17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1

'Ext.' = Extreme ;

'Imp.' = Imperfect;

'Per.' = Perfect.

217. The major triads in **second** relationship with the chord of *C* are, it will be seen, the tonic chords of the major keys that



are in second relationship with the key of *C* (p. 320). In each of these chords, there is one note common to the chord of *C*. The triads at (a) and (b) are also in second relationship with the dominant chord, and those at (c) and (d) in second relationship with the subdominant chord of *C*.

All ordinate chromatic chords may be introduced after the tonic chord, but it may be desirable in certain cases to invert this

chord. In rule IX, (p. 185,) it is stated that false relation is frequently employed in compositions, between two major triads, the roots of which move a major or minor third; such false relation, however, should be employed only for some particular effect; as a general rule, it is preferable to let the parts move as smoothly as possible, when the chromatic element is introduced.

The following examples illustrate the use of the triads in second relationship with the chord of C:

(a) (b)

(c) (d) (e) (f)

$b5$ $\sharp b6$ \sharp \sharp 6 \sharp 7 $b5$
 $-III+$ $\frac{4}{3}$ $III+$ 3 $-VI+$ \sharp $VI+$ $\sharp b6$ $III+$ $-VI+$

The progression at (e) is the Phrygian cadence (p. 172), one of the most popular uses of the mediant major triad; that at (f) exemplifies the cadential use of the minor submediant major triad, a progression which may be regarded as having been borrowed, in the first instance, from the affinitive minor key.

218. The major triads in **third** relationship with the chord of C possess a feature of interest not to be found in those of second



relationship, namely, that they may be introduced, after the tonic chord, without chromatic movement in any of the parts; wherefore, each of the above triads is in diatonic relationship with the chord of *C*. For example:

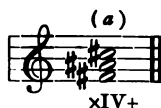
the progression, I+ to -II+, occurs in the key of *F* minor, as V to VI;
 “ “ I+ to II+, “ “ “ “ “ *G* major, “ IV to V;
 “ “ I+ to VII+, “ “ “ “ “ *F* major, “ V to IV;
 “ “ I+ to L+, “ “ “ “ “ *E* minor, “ VI to V.

The following examples illustrate the use of the triads in third relationship with the chord of *C*. The progression at (a) exemplifies extreme relationship in proceeding to the dominant chord:

(a) (b) (c) (d)

b5 6 #47 6 #5 #45
 -II+ 5 II+ VII+ 5 L+

219. The major triad in **extreme** relationship with the chord of *C* is a *subordinate* chromatic. This chord was rarely, if ever,



employed by the classic composers of the past, but some reference to it is justified by the fact that it is occasionally to be found in the works of modern composers. This triad does not occur in any of the associated scales of *C*, and its constituent notes, moreover, unlike those of other major triads are *all* foreign to the scale of *C*, consequently, it possesses no tonal relationship with the key of *C*. Its scientific origin is to be found in the harmonics of the generator *B*.—Nos. 12, 15, 18 (Appendix iii).

The following example illustrates the use of the extreme triad.

(b)

6 #5 4 6
2
xIV+

There is but little justification for the use of oV_+ , the enharmonic equivalent of xIV_+ :

(c)

oV_+

and, if employed otherwise than in accordance with the conditions about to be considered, the notation may be regarded as being false.

Every common chord possesses, to a certain degree, a tonic character. When, therefore, a chord of *G* is employed in the key of *C*, the key of *G* may be said to be temporarily suggested, and the major triad (*F* sharp) would then become an ordinate chromatic, and its use at once justified. In like manner, when a chord of *F* is employed in the key of *C*, the subdominant key may be said to be temporarily suggested, and then the *G* flat major triad would become an ordinate chromatic, and, under such conditions, it may be accepted as correct notation.

A curious equivocal effect, tantalizing, and even verging on the unmusical, may be obtained by alternating the chords I_+ and xIV_+ , thus:



The chord at (d) seems to possess a dominant character, and its natural progression would be to a chord of *B* (major or minor). Now, if this chord (d) be enharmonically changed to *G* flat major (oV_+), and regarded as a tonic chord, then the (following) chord, *C*, will be the xIV_+ in that key, and \sharp in turn will appear to possess a dominant character; and so on. Thus, there will arise a sense of indeterminate tonality which, though far from being satisfactory under ordinary circumstances, might be invaluable in the portrayal of some dramatic situation.

The effect of the extreme triad is the temporary disturbance of tonality, and if this particular effect be desired, it is at least fortunate that a chord exists for the purpose, but such a consideration will very rarely arise in connection with academic work. The student must exercise care and caution in the employment of even the ordinate chromatic chords, while, in regard to the subordinate chromatics, he is strongly advised to avoid them altogether.

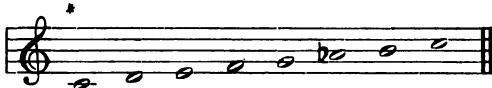
220. The **minor triads** of music, in relation to the triad of *C* minor, are exhibited in the following example:



These triads, in their relationship to the key of *C* major, like the major triads, are divided into four classes. The triads at (*a*), being diatonic to the key of *C*, are in *first* relationship; the triads at (*b*) are in *second* relationship; the triads at (*c*) are in *third* relationship; and the triads at (*d*) are in *extreme* relationship. The triads at (*b*) and (*c*) are ordinate chromatics, those at (*d*) subordinate chromatics.

221. To one of these chromatic minor triads, namely IV⁻, great importance is attached. This chord, it may be remembered, was employed as the "link" in modulating diatonically to certain of the extraneous keys (Chapter xviii). IV⁻ in conjunction with I⁺ and V⁺ constitutes the harmonic basis (p. 44) of a scale which may be said to be the link between the major and the minor mode, and which, therefore, is called:

The Major-minor Scale of *C*



Since a diatonic scale may be regarded as comprising the material from which diatonic chords are constructed, it will be seen that a tonality thus arises which differs from the major mode in one particular only, namely, that -VI is employed instead of +VI. This note consequently plays a very important part in the realm of chromatic harmony, being available for use as the root, third, fifth, seventh or ninth in chord formation. Its importance arises from the fact that it is the only chromatic note obtained from the dominant, the most important of all generators, and the only generator of a primary *diatonic* discord.

Although this triad, IV⁻, is an ordinate chromatic in second relationship with the tonic chord, yet the progressions I⁺ to IV⁻

* This scale, it may be said, is taught in conjunction with the major and minor diatonic scales in some institutions, for example, the Conservatory of music at Brussels.

and IV- to I+ possess almost a diatonic effect, as will be seen by comparing the example at (a) which is in the key of C major with that at (b) which is in the key of F minor:

(a) (b)

I \flat IV- I \sharp I \sharp V

222. The triads I-, V-, VII- and L-, as compared with IV-, are of but little importance. I-, in order not to disturb the tonality, is generally introduced as a passing discord, as at (a). The use of V- and VII- are exemplified at (b) and (c). L- is of very rare occurrence; it may be employed as at (d) in order to avoid the dissonant triad L_o:

(a) (b) (c)

3 \flat 3 I- 5 6 \flat - \sharp - 6 \flat \flat 7 VII- \sharp

(d)

\sharp 5 L-

The subordinate minor triads of the major mode are of even less importance than the subordinate major triad, and, as the student is advised not to employ these chords at all, their use will not here be exemplified.

223. The chromatic material of the **minor mode** is to be found in the *harmonic* form of the chromatic scale (p. 36), as this scale comprises all the notes of the associated scales; and, since there is no enharmonic element in this scale, it follows that the chromatic triads of the minor mode differ considerably from those of the major mode. Another reason for this difference will be found in the fact that the minor scale possesses in itself a certain chromatic element, an element wholly foreign to the pure diatonic character of the major scale. For example, the accidental, the use of which is necessary to establish the leading-note, gives rise to two important chromatic intervals, the augmented second and the augmented fifth, together with, of course, their inversions. Furthermore, the minor scale, as has already been stated (p. 33) is not a natural scale, it is an artificial scale, being derived from the major scale, whether regarded from the relative or the affinitive standpoint. In the matter of tonal intensity, moreover, the notes of the minor scale do not occur, like those of the major, in regular order. L (as in the major scale) is the acutest, but VI (not IV) is the gravest; and if the tonal intensity of L be represented by the number one, then that of VI will be represented by ten, as shown, in relation to the scale of C minor, in the following table:

10	9	7	6	5	4	1
<i>A^b</i>	<i>E^b</i>	<i>F</i>	<i>C</i>	<i>G</i>	<i>D</i>	<i>B[♯]</i>

As the melodic (or additional) triads of the minor mode have already been considered (Chapter vi), no further reference need be made to their use; it may be said, however, that, although they are included among the chromatic chords of the minor mode, yet their employment is almost invariably in connection with diatonic progressions, three of these triads, III+, V+, and VII+, requiring no accidental at all in their formation.

The major and minor triads of music, in relation to the triads of C major and C minor respectively, are exhibited in the following examples:



The above triads, in their relationship to the key of C minor, are divided into four classes. The triads at (a), being diatonic to the key, are in *first* relationship; the triads at (b), the melodic triads, are in *second* relationship; the triads at (c) are in *third* relationship; and the triads at (d) are in *extreme* relationship.

When a passage in the major mode which includes the Phrygian cadence, is transcribed into the minor mode, a cadence arises which is termed the Dorian cadence. This cadence is usually regarded as modulating to the relative major key, but as the symbolization (viz. II¹ to III⁺) is the same as that employed in the major mode for the Phrygian cadence, and as III⁺, moreover, is one of the melodic triads of the minor mode, it — the Dorian cadence — may be accepted as an integral part of the minor mode, and as inducing no change of tonality.

224. No definite rules can be laid down as to the introduction of chromatic triads in either the major or the minor mode, but it may be said that all the possible harmonic progressions in relation to diatonic triads (as shown in the following table) are available, as a general rule, for introducing chromatic triads.

Diatonic Progressions	Examples	
	Major mode	Minor mode
I. From major triad to major triad		
Roots rising 2-		V+ to VI+
" falling 2-		VI+ to V+
" rising 2+	IV+ to V+	
" falling 2+	V+ to IV+	
" rising 4	{ I+ to IV+	
" falling 4	{ V+ to I+	
	{ I+ to V+	
	{ IV+ to I+	
II. From major triad to minor triad		
Roots falling 2-	IV+ to III-	
" rising 2+	{ I+ to II-	
" falling 2+	{ V+ to IV-	V+ to IV-
" " 3-	{ I+ to VI-	VI+ to IV-
" rising 3+	{ IV+ to II-	
" " 4	{ V+ to III-	
" falling 4	{ I+ to III-	VI+ to I-
	{ IV+ to VI-	V+ to I-
	V+ to II-	
III. From minor triad to minor triad		
Roots rising 2+	II- to III-	
" falling 2+	III- to II-	
" rising 4	{ III- to VI-	I- to IV-
" falling 4	{ VI- to II-	IV- to I-
	{ II- to VI-	
	{ VI- to III-	
IV. From minor triad to major triad		
Roots rising 2-	III- to IV+	
" " 2+		IV- to V+
" falling 2+	{ II- to I+	
" rising 3-	{ VI- to V+	
" falling 3+	{ II- to IV+	IV- to VI+
" rising 4	{ III- to V+	
" falling 4	{ VI- to I+	
	{ III- to I+	I- to VI+
	{ VI- to IV+	
	II- to V+	I- to V+

An example will illustrate the application of the above table. Since, roots rising a minor second from major triad to major triad, are justified by the progression V_+ to VI_+ in the minor mode, so *any* major triad may proceed to another major triad with roots rising a minor second; wherefore, the chord of C major may proceed to a chord of D flat major, a progression which occurs as V_+ to VI_+ in the key of F minor.

225. The two most frequently employed chromatic triads in the minor mode are $-II_+$ and II_+ , the former borrowed from the subdominant key, and the latter from the dominant. These two triads, together with the rarely employed I_+ , and the natural harmonic and melodic triads of the key, comprise all the notes of the harmonic form of the chromatic scale. Of the remaining chromatic triads, VII_- , is the most important. These three triads are illustrated in the following example:

The image displays three musical examples, (a), (b), and (c), each showing a chromatic triad in a piano-style arrangement with a treble and bass clef. The key signature has two flats (B-flat and E-flat).

- (a) $-II_+$: The triad consists of the notes B-flat, D-flat, and F. The label $-II_+$ is written below the bass staff.
- (b) II_+ : The triad consists of the notes C, E-flat, and G. The label II_+ is written below the bass staff.
- (c) VII_- : The triad consists of the notes D-flat, F, and A-flat. The label VII_- is written below the bass staff.

The root movement to the triads at (a) and (b) will be found in group iv, and to the triad at (c), in group iii, in the above table.

The triads $+III_-$, $+VI_-$ and L_- , although they occur in associated scales, their constituent notes, therefore, being found in the harmonic form of the chromatic scale, are of comparatively little value, and, from the standpoint of use, they may well be regarded as belonging to the same category as subordinate chromatic triads.

The progression from a minor triad to a major triad on the same root, and vice versa, is good; but, in this case especially, false relation must be avoided. I_+ , in order not to disturb the tonality, may be employed thus:

(d)

3 $\sharp 3$ 8 9 8 7
 I_+ 7 - $\flat 6$ 5
 \sharp

226. The **inversions** of chromatic triads, though of less frequent use, are just as important as the inversions of diatonic triads, and the rules which govern the latter are generally applicable to the former. It is, however, rarely desirable to double the bass in the first inversion of a chromatic triad, except alone in the case of $-II_+^1$ (the Neapolitan sixth) when, indeed, it is customary to do so.

The following example illustrates the use of some of the more frequently employed first inversions:

(a) (b) (c)

$\flat 6$ $\sharp 6$ 6 6 6 7 6 7 6 7-
 \flat 4 4 3 4 3 6 5
 $-II_+^1$ 2 II_+^1 III_+^1

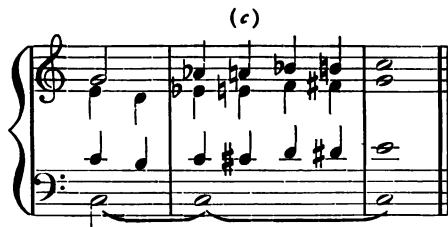
The triad at (a) is the Neapolitan sixth, which has already been explained in Chapter xviii, §207; it is customary for the root,

which is generally the best treble-note, to fall, as shown above, but there is no absolute restriction in this respect. The triad at (b) being the borrowed dominant chord of the dominant key, it is strictly forbidden to double the bass; the resolution upon a cadential six-four avoids a modulation. The triad at (c) exemplifies the use of a chromatic chord in an irregular cadence, or, as in this case, an extended form of the perfect cadence.

227. The **extreme** triad, $\times IV+$ under certain conditions, may be employed with good effect in its first inversion; it is preferable in three-part harmony, or over a pedal note, and should be introduced in relation to the dominant chord, as at (a); in like manner, its enharmonic equivalent, $\circ V+$, may be introduced in relation to the subdominant chord, as at (b):



The above chords, however, may also be regarded as chromatic auxiliary chords, and upon similar lines a chromatic passage, as at (c), may be constructed:



228. The second inversion of chromatic triads is of much less frequent use than the first inversion; and since chromatic triads as compared with diatonic triads, are of rare occurrence, it follows

that their second inversions are employed only in exceptional cases. Their use depends entirely upon the harmonic situation; thus, at (a), I^{-2} is introduced as a chromatic passing chord in connection with the cadential six-four; and at (b), IV^{-2} is employed as a pedal six-four; at (c) the second inversion of $-II^{+}$ is exemplified; but this chord is far from being as effective as the first inversion, the Neapolitan sixth:

(a) (b) (c)

6 $\flat 6$ 5 5 $\flat 6$ 5 6 $\flat 6$ 6
 4 - 3 3 4 3 $\flat 4$ 4
 I^{-2} IV^{-2} $-II^{+2}$ 3

The important question of harmonizing melodies, whether assigned to the treble or any other voice, including unfigured basses, will be considered in chapter xxv., where a table will be found in which chromatic chords generally are suggested for the various chromatic notes. The exercises at the end of the present chapter, and succeeding chapters to xxiv inclusive, are of a distinctive character and especially prepared to illustrate the use of the chords under consideration in each chapter; the student must rely upon his ingenuity to introduce and employ suitable chords, but, it may be said, that he will find less difficulty with the exercises in these chapters, than with those in chapter xxv, where the choice and character of the chords is left entirely to his own good judgment.

229. No rules can be laid down with regard to the employment of chromatic triads or their inversions. As the term "chromatic," in its original significance, has reference to colors, so chromatic chords may be said to lend color to tonality. An interesting comparison has been made between the notes of the major diatonic scale and the colors of the spectrum — red, orange, yellow, green,

blue, indigo and violet, which, together with intervening colors, depicting the chromatic notes, constitute the color material at the command of the painter, just as the notes of the chromatic scale constitute the tonal material at the command of the composer. The comparison may be fanciful, but it is suggestive of a bond of union between the sister arts of painting and music, with their scientific bases of light and sound, both of which owe their existence to vibration, and, furthermore, it may suggest to the student that just as colors may be blended in a manner offensive to the eye, so, also, chords, and especially chromatic chords, may be introduced into musical compositions in a manner offensive to the ear.

Particular care is essential with regard to the employment of subordinate chromatic chords, which may be regarded in the light of exceptional color effects. These extreme chords belong to a key only on the ground that, provided the end justifies the means, any chord may be employed in any key. Experience alone will enable the student, when he enters the realm of composition, to employ these chords with good effect, and, at that period in his career, he will, not improbably, have learned to regard the rules and laws of harmony from the same standpoint that the poet regards the rules and laws of grammar, adhering to them on general principles, and infringing them only when the means justifies the end.

SUMMARY

§ 215. Chromatic chords, order of study.

(1) Triads, (2) Tetrads and Pentads, (3) Modifications.

The melodic form of the chromatic scale, the basis of the major mode: the harmonic form, the basis of the minor.

§ 216. The major triads of music in relationship to *C* major.

The diatonic triads, in first or perfect relationship; the chromatic, in second, third and extreme relationship.

§ 217. The second relationship triads.

Tonic chords of keys in second relationship.

- § 218. The third relationship triads.
Though chromatic chords, yet they are in diatonic relationship.
- § 219. The one triad in extreme relationship.
A subordinate chromatic chord, and, as such, its use by students is not recommended.
- § 220. The minor triads of music in relationship to *C* major.
The diatonic triads, in first relationship; the chromatic, in second, third and extreme relationship.
- § 221. IV-, the most important minor triad of the major mode.
The major-minor scale.
- § 222. The other chromatic triads.
Comparatively of little importance.
- § 223. The major and minor triads of the minor mode.
- § 224. The diatonic progressions.
Generally available for introducing chromatic chords.
- § 225. -II+, II+ and VII-, the most important chromatic triads of the minor mode.
- § 226. The first inversion of chromatic triads.
- § 227. Special use of the extreme triad.
- § 228. The second inversion of chromatic triads.
- § 229. A comparison between the tonal material of music and the color material of painting.

EXERCISES

I

1. Define a chromatic chord. Classify the chromatic chords in general use.
2. Write the chromatic scales of (a) *A* and (b) *E* flat, in both their major and minor forms; and give the melodic symbol employed for each note.
3. Explain the meaning of "tonal intensity," as applied to both diatonic and chromatic notes.
4. Give the technical name employed for each of the seventeen notes in the extreme chromatic scale. Classify the chromatic

notes. Explain the meaning of "Hyper-tonic" and "Hypo-dominant."

5. Explain the meaning of the terms "Ordinate" and "Sub-ordinate," as applied to chromatic chords.

6. Name the degrees of relationship existing between a tonic major triad and all other major triads; give examples in the key of *E*.

7. Compare the relationship between the major and minor chromatic triads of the major mode, giving examples in the key of *A* flat.

8. Write the major-minor scales of (a) *B* and (b) *D* flat. Explain the harmonic source of the minor submediant. Is the major-minor scale in use at the present day?

9. In what respect does the chromatic material of the minor mode differ from that of the major? Show that the minor scale, from its very nature, is essentially an artificial scale.

10. Write a phrase in the key of *D* major, concluding with the Phrygian cadence, then transcribe it into the affinitive minor key, and name the cadence with which the new phrase concludes.

11. Compare the relationship between the major and minor chromatic triads of the minor mode, giving examples in the key of *F* sharp minor.

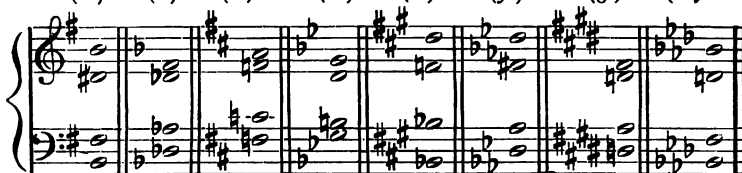
12. Explain any points of difference between inverted and uninverted chromatic triads. Is the second inversion of these triads subject to the rules which apply to the second inversion of diatonic triads?

II

13. Introduce the following chords. Commence with the tonic and end with the perfect cadence, employing not more than four or five chords in each exercise:—

Major Keys

(a) (b) (c) (d) (e) (f) (g) (h)

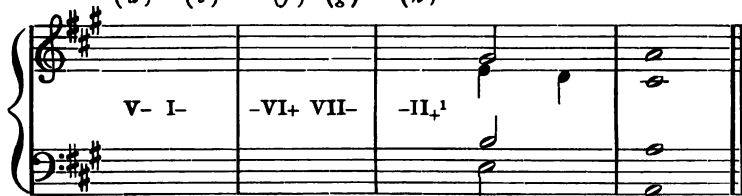


14. Complete the following passage by inserting the chords indicated by the symbols. Figure the bass.

(a) (b) (c)



(d) (e) (f) (g) (h)



15. Add alto and tenor parts to the following exercises:—





7 — 5 — 7 6 5 #4 5 - b - b5 — b —
 5 - 6 - 4 - 2 - 4 - 3 #2 3 -
 #2 - 3 3



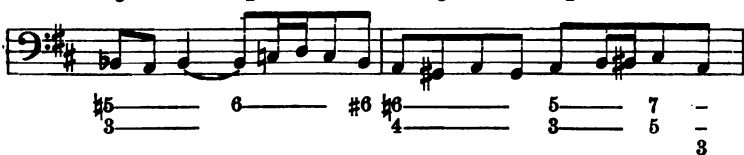
b5 — b b7 8 — - b9 8 7 b5 - 5 b6 8 —
 #8 7 6 5 - 6 5 3 3 b3 - b6 5 4 5
 4 2 - 3 — 4 3 2 3

Add treble, alto and tenor parts to the following:—

I6



I7



5 — $\flat 6$ — $\sharp 5$ — $\flat 6$ — $\flat 5$ — 7 6 $\sharp 5$ 6 $\sharp 6$
 3 — 4 — 3 — $\flat 4$ — $\flat 5$ — 3 —

$\sharp 5$ — 9 8 7 8 9 8 7 $\sharp 5$ — 6 — $\sharp 6$
 \sharp — 6 5 4 6 7 6 5 3 — $\flat 5$ — $\sharp 6$
 4 3 2 4 — 3 — \sharp — \flat — \sharp

18

0 — 6 6 6 6 — 5 6 4 3 2 3 0 0
 \sharp — 6 5 3 4

1 — 6 6 6 6 5 5 6 4 3 2 3 0 0 \sharp $\sharp 5$ $\sharp 5$
 3 — 6 — 3 4 x

$\sharp 5$ 7 4 3 2 3 0 0 7 6 6 6 6 6 \sharp 6
 \flat \sharp — 5 \sharp

$\sharp 6$ 5 1 — 0 — 7 \sharp —
 4 \sharp \sharp

19. Write a *real* sequence (falling minor seconds), employing the following model; repeat the model four times, and add a short coda ending in the original key.

The model shows a grand staff with a treble clef and a bass clef. The key signature has one sharp (F#). The melody in the treble clef starts on G4 and descends chromatically: G4, F#4, F4, E4, D4, C4, B3, A3, G3. The bass clef accompaniment consists of a steady eighth-note pattern: G3, A3, B3, C4, D4, E4, F#4, G4.

20. Clothe the following blank rhythm with harmony, in the key of *A* flat, employing the chords indicated by the symbols:—

Two staves of music, each with a 2/2 time signature. The first staff contains four measures of blank rhythms (half notes). Below the first staff are the following chord symbols: I, -VI+, IV-, II+¹, V₇, III+¹, IV¹, V₇¹, IV², I. The second staff contains four measures of blank rhythms (half notes). Below the second staff are the following chord symbols: VI+, IV, V-, III+, VII+, II¹, I¹, V₇, I.

III

Harmonize the following basses:—

21

Two staves of music in bass clef. The first staff is in 2/2 time with a key signature of two sharps (F# and C#). It contains four measures of bass lines. The second staff is in 2/2 time with a key signature of two flats (Bb and Eb). It contains four measures of bass lines.

22

Three staves of music in bass clef. The first staff is in 2/2 time with a key signature of two flats (Bb and Eb). It contains four measures of bass lines. The second staff is in 2/2 time with a key signature of two flats (Bb and Eb). It contains four measures of bass lines. The third staff is in 2/2 time with a key signature of two flats (Bb and Eb). It contains four measures of bass lines.

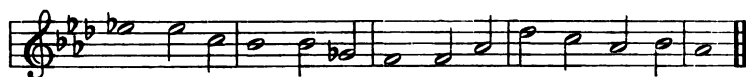
Harmonize the following melodies:—

23

One staff of music in treble clef, 4/4 time, with a key signature of two sharps (F# and C#). It contains a melody of eight measures.



24



25

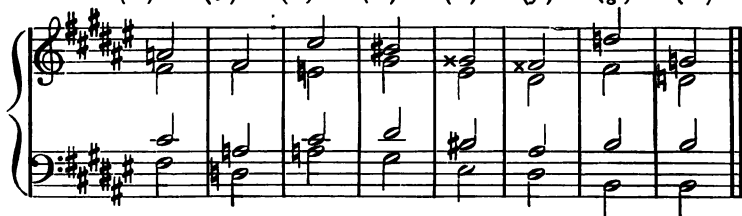


26



27. Compose a long metre hymn-tune, in the key of *F* sharp major, introducing the following chords:—

(a) (b) (c) (d) (e) (f) (g) (h)



28. Write a musical sentence in the key of *F* minor, introducing chromatic concords, including the melodic triads.

CHAPTER XX

CHROMATIC DISCORDS

230. Chromatic discords, like diatonic discords, are divided into two classes, the **Essential** and the **Unessential**. The former include all fundamental discords, namely, tetrads and pentads (with their derivatives) both primary and secondary; the latter, which arise chiefly from the use of auxiliary notes, are included under the name of chromatic modifications. The essential discords only will be considered in the present chapter, the unessentials being reserved for Chapter XXII, after the diatonic modifications have been explained.

It is desirable for the student to be familiar with the theory of the chromatic element in music as presented in the Introduction (Part III) before commencing to study the present chapter.

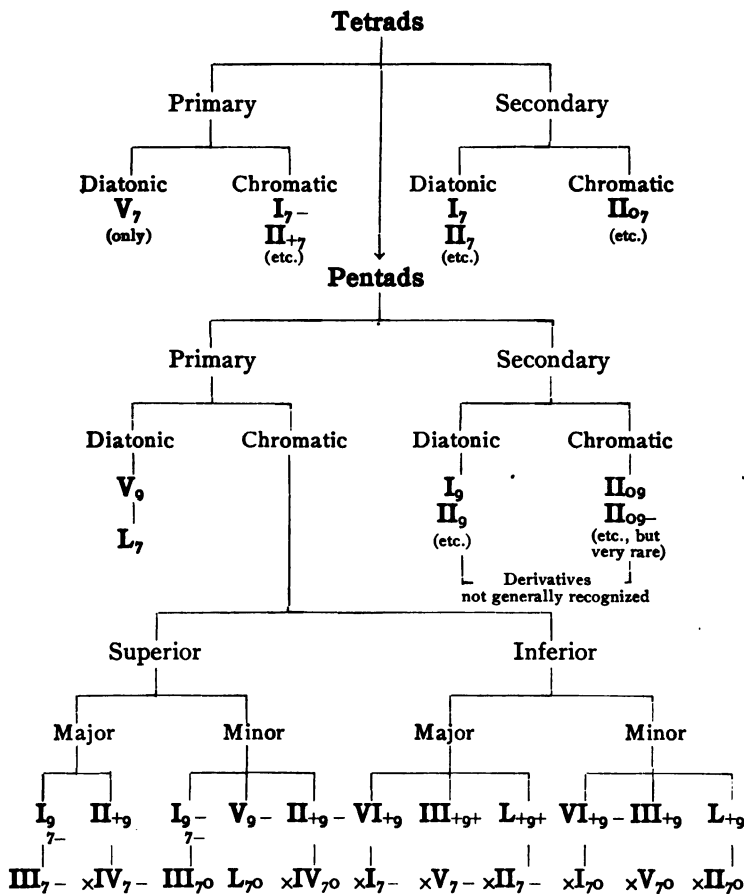
Tetrads are of two distinct kinds, namely, the *natural* and the *artificial*. Natural tetrads are divided into two classes, the primary and the secondary, each of which may be either diatonic or chromatic. Artificial tetrads are derivatives of pentads. There is only one primary diatonic tetrad, namely, V_7 ; secondary diatonic tetrads were explained in Chapter XII.

Primary tetrads are obtained by adding a minor seventh to the notes of a major triad. The complete series of primary tetrads in the key of *C* major are shown in the following example:



The tetrads at (a) are the ordinate chromatics, their constituent notes forming part of the modern enharmonic scale of C; the tetrads at (b) are subordinate chromatics.

The following table exhibits the fundamental discords of the major mode:



N.B. The signs + and - are only employed when the note indicated does not form part of the diatonic scale.

231. Special importance is attached to the **tetrads on I and II**, due to their close relationship to the tonic key, as diatonic primary tetrads in the subdominant and dominant keys. A certain freedom of treatment, moreover, is accorded to II_{+7} , which is not applicable to any other chromatic tetrad. Thus, the seventh may be doubled, one seventh rising a second as at (a), or rising a third as at (b); or the seventh may fall a fourth as at (c), or rise a fourth as at (d):—

(a) (b) (c) (d)

$\begin{matrix} 7 & \#7 \\ \text{II}_{+7} \end{matrix}$

 $\begin{matrix} 7 & \# & 6 & 8 & 7 \\ & 4 & 3 & - \\ \text{II}_{+7} \end{matrix}$

 $\begin{matrix} 7 & \#7 \\ \text{II}_{+7} \end{matrix}$

 $\begin{matrix} 7 & \# & 6 \\ & 5 \\ \text{II}_{+7} \end{matrix}$

The reason for the exceptional treatment of the seventh in this case may be attributed to *a certain sense of freedom* which appertains to the tonic of a key. This feature appertains also, though in a lesser degree, to the subdominant and dominant, these latter notes being the tonics of the nearest related keys; wherefore, V_7 may possibly be treated on similar lines, the seventh of the root being IV.

The student, however, will be well advised, as a general rule, to write harmony in the strict rather than in the free style, and especially at examinations, when his work is judged almost entirely from the academic standpoint.

232. No such liberties as the above may be taken with I_7- , nor with the other chromatic tetrads; in these chords the seventh must not be doubled, nor may either the third or seventh move disjunctly in resolution. The function of the tonic chord being 'rest,' I_7- is less frequently employed than II_{+7} . The more usual resolutions of this chord are illustrated in the following example:—

(a) (b)

$I7-$ $7^\#$ 7 $7^\#$
 $I7-$ $II+7$

False relation, as has already been said (rule ix, page 185), is not objectionable in proceeding to and from a primary fundamental discord, and such progressions as the following are of common occurrence:

(c)

$I+$ $II+7$ $V7$ $I7-$ $II+7^\#$ $V7$ I

233. As the *inversions* of these tetrads are the same, to all intents and purposes, as those of $V7$, further examples of their use would be superfluous; reference, however, must be made to the **diminished triad**, a derivative, obtained by omitting the root, of a primary tetrad. This derivative, like the diminished triad on L, though of comparatively little use in root position, and of practically no use at all in its second inversion, becomes an important chord when employed in its first inversion. Like L^1 , the bass and third may be freely doubled, but the sixth, possessing in a large degree the character of a leading-note, should not be doubled. This

triad may also be regarded as the incomplete form of the second inversion of a tetrad. At (a) IV_0^1 , and at (b) III_0^1 , derivatives, respectively, of II_{+7} and I_{7-} , are exemplified. A derivative is symbolized from its apparent or nominal root, the real root or generator of the triad at (a) being II, and of that at (b) being I:

(a) (b)

The image shows two musical examples, (a) and (b), each consisting of a grand staff with a treble and bass clef. Example (a) shows a sequence of chords: a triad of G4, B4, D5 (labeled 6), a dyad of G#4, B4 (labeled #6), a triad of G4, B4, D#5 (labeled 6), and a dyad of G4, B#4 (labeled #b5). Below these are the labels xIV0^1 and #5. Example (b) shows a sequence of chords: a triad of F#4, A4, C5 (labeled 6), a dyad of F#4, A4 (labeled b), a triad of F#4, A4, C#5 (labeled 7), and a dyad of F#4, A#4 (labeled #). Below these are the labels III0^1 and #.

234. The following examples illustrate the use of other ordinate primary chromatic tetrads:

The image shows two musical examples, (c) and (d), each consisting of a grand staff with a treble and bass clef. Example (c) shows a sequence of chords: a triad of E4, G4, B4 (labeled #4), a dyad of E4, G4 (labeled 2), a triad of E4, G4, B4 (labeled #b5), a dyad of E4, G#4 (labeled 5), a triad of E4, G4, B4 (labeled 6), a dyad of E4, G4 (labeled 4), a triad of E4, G4, B4 (labeled 3), a dyad of E4, G4 (labeled 6), a triad of E4, G4, B4 (labeled #6), a dyad of E4, G#4 (labeled 4), a triad of E4, G4, B4 (labeled #b5), a dyad of E4, G4 (labeled 7), and a triad of E4, G4, B4 (labeled 3). Below these are the labels III+7^3, VI+7^1, and L+7^2. Example (d) shows a sequence of chords: a triad of E4, G4, B4 (labeled #4), a dyad of E4, G4 (labeled 2), a triad of E4, G4, B4 (labeled #b5), a dyad of E4, G#4 (labeled 5), a triad of E4, G4, B4 (labeled 6), a dyad of E4, G4 (labeled 4), a triad of E4, G4, B4 (labeled 3), a dyad of E4, G4 (labeled 6), a triad of E4, G4, B4 (labeled #6), a dyad of E4, G#4 (labeled 4), a triad of E4, G4, B4 (labeled #b5), a dyad of E4, G4 (labeled 7), and a triad of E4, G4, B4 (labeled 3). Below these are the labels III+7^3, VI+7^1, and L+7^2.

These chords, it will be seen, may all be introduced after the tonic; and there are three forms of resolution, (1) upon V_7 , as given in the above example, (2) upon I, and (3) upon another chromatic chord, which in turn should resolve upon I or V_7 . It is desirable, as a rule, to let the parts move as smoothly as possible, chromatic changes, in particular, (notwithstanding the possibility of false notation), being confined to the same voice. The same remarks hold good with reference to the inversions, which, being

practically the same as those of V_7 , it will not be necessary to exemplify. The derivatives of these tetrads are available for use, and may be treated on the lines explained in the preceding section.

235. The chromatic primary tetrads of the minor mode are fewer in number than those of the major mode, being limited to the following five chords only:



These tetrads may be introduced and resolved in practically the same manner as those of the major mode; it will, therefore, not be necessary to exemplify their use. The tetrads on I and II are the most popular, and the latter may be treated in equally as free a manner in the minor as in the major mode.

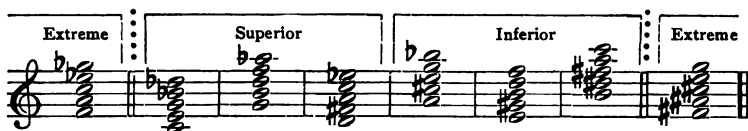
236. In the Introduction (Part III), page 385, it was demonstrated that the origin of the chromatic element in music was to be found in a series of **primary minor pentads**, commencing on the tonic, as the primal generator of the whole tonal material of the key, continuing with a succession of roots, each rising a perfect fifth, and concluding with the leading-note.¹ The pentads on I, V and II, being the dominant minor ninths of the subdominant, the tonic and the dominant keys respectively, are known as the *superior* pentads; the others, on VI, III and L, are known as the *inferior* pentads.

The superior pentads comprise the *ordinate* tonal material of the minor mode; the superior and the inferior together comprise the *ordinate* tonal material of the major mode.

This series of pentads may be logically extended by the addition of two other primary minor pentads, one at either end of the series, known as the **extreme pentads**, which furnish the extreme chromatics, $\circ V$ and $\times VI$ (in the key of C, G flat and A sharp, respectively) as employed in *subordinate* chromatic chords.

¹ The *minor* tetrads are employed simply because they comprise a greater number of chromatic notes than the major.

The complete series will, therefore, be as follows:



The complete series furnish the notes of the *extreme* (or the instrumental form of the) chromatic scale, and incidentally justify the notation of this scale.

The superior and inferior pentads together furnish the notes of the *major* (or the melodic form of the) chromatic scale, and at the same time, as explained in the Introduction (Part III), the notes of the modern enharmonic scale.

The superior pentads alone furnish the notes of the *minor* (or the harmonic form of the) chromatic scale.

237. Upon each of the above generators a *major* pentad may also be formed; and both major and minor pentads are equally available for use in the major mode. The major pentad on V is, of course, a diatonic discord, but the minor pentad on V, and the others, both major and minor, are all chromatic. These chords are generally treated in the same manner as V₉ (Chapter XIII), both in root position and in the inversions. In four-part harmony, the fifth is omitted; the ninth must never be placed a second above the root, if L is present; both the seventh and ninth must be resolved, but neither of these notes require preparation; and since they are chromatic chords, they must not be resolved upon the tonic chords of the keys in which they naturally occur as dominant ninths. The most popular of these pentads (like the chromatic tetrads) is that upon II, which is frequently employed as a pre-cadential chord, as at (a); the first inversion of this chord is shown at (b); and the third inversion of the major pentad on I, at (c).

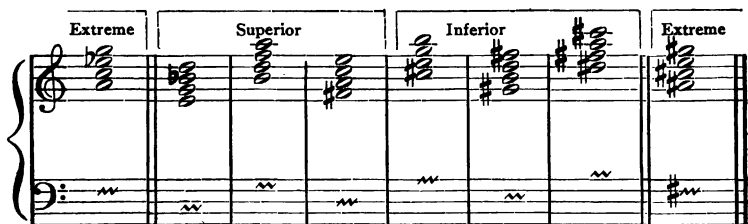
With the third omitted, the ninth is regarded as a second; the chord then becomes a "modified tetrad," and as such it will be considered in Chapter XXI.

4. The fifth is always diminished, and must not be omitted or doubled.

5. The fifth, as well as the seventh, must be resolved by (1) falling one degree, (2) remaining stationary, or (3) rising chromatically; but in the first inversion, the third of the bass (*i.e.*, the fifth of the root) may rise one degree, in order to avoid doubling the bass in a chord of the sixth, as it is customary for the bass also to rise one degree, in order to avoid consecutive fifths with the falling seventh.

Thus no note of an artificial tetrad may be omitted, or doubled; and the third alone is free in resolution.

239. The following example comprises **the minor tetrads**, in the key of *C*. The generator of each chord is indicated by a *direct* on the bass stave, but this note, having fulfilled its purpose, is no longer a recognized part of the chord, and the note upon which each of the tetrads is constructed, becomes the nominal root, as in the case of L_7 and L_{70} (Chapter XIV). L_7 , of course, is a diatonic chord; it is included here in order that the series may be shown in its complete form:



The superior tetrads, on account of their closer relationship with the tonic key, are employed more frequently than the inferior. The most popular of these chords, $\times IV_7$, unlike its precursor Π_7 , is rarely resolved in an exceptional manner; it usually proceeds to a cadential six-four, as at (a). III_{o7} , in order to avoid modulation, may resolve upon V_7 , as at (b), or upon another chromatic chord, as at (c):—

(a) (b) (c)

7 6 7 7 7 7 7 5 7
 $\times IV_7$ 4 3 $b5$ \sharp III_{o7} $b5$ $\times IV_7$

The following example illustrates the use of the inferior minor tetrads; but these chords are almost invariably treated and regarded as chromatic modifications:

(d) (e) (f)

7 4 6 7 \sharp 6 6 7 \sharp \sharp 6
 3 \sharp 5 \sharp \sharp
 $\times I_7$ $\times V_7-$ $\times II_7-$

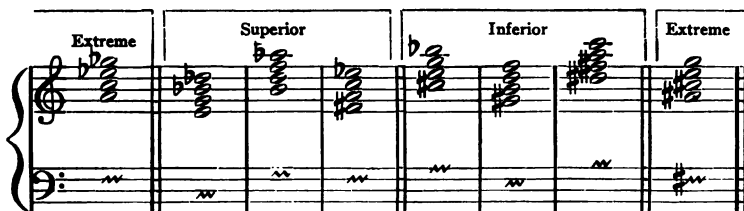
Such extreme progressions, as the above, are rarely employed in vocal music and even in instrumental music they can rarely be introduced with very good effect.

Care must be taken not to confuse these artificial tetrads with the natural secondary tetrad on II of the minor mode; these chords, which are exactly the same in formation, though entirely different in effect, may be distinguished by their resolutions, the latter naturally resolving upon the dominant chord of the minor mode. Equivocal chords, such as these, play an important part in modern compositions. Furthermore, there is the secondary diatonic tet-

rad on L, (L_7) the formation of which is also the same as the minor tetrad, but which is rarely employed except in the dominant sequence (§ 113). While, finally, in its first inversion, the minor tetrad is the same in formation as the "added sixth" of the minor mode. The treatment of these chords in relation to L_7 , was explained, and the various resolutions were exemplified in § 135; it will, therefore, be unnecessary to consider the subject further in connection with the chromatic tetrads.

In the minor mode the superior tetrads *only* are available for use, and even these are of very rare occurrence, on account of their tendency to disturb the tonality; if employed at all, it is desirable to treat them in the light of chromatic modifications.

240. The following example comprises the diminished tetrads in the key of C. The generators are indicated by a *direct* on the bass stave, but as in the case of the minor tetrads, so also with the diminished, the note upon which the tetrad is constructed becomes the nominal root:



The inferior diminished tetrads are *the enharmonic equivalents* of the superior; this feature arises from the exigencies of equal temperament, which admits of only three distinct diminished tetrads in the whole realm of music. The inferior tetrads, however, are independent chords, with a character of their own, which is the result of the enharmonic change of the seventh, the flattest note of the superior tetrad to the root, the sharpest note of the inferior tetrad.

The superior tetrads alone are available for use in the minor mode, in which mode the natural tendency of the seventh is to fall

a minor second to a diatonic note of the scale. When employed in the major mode, however, the tendency of the seventh in these chords is ambiguous; it may either fall a semitone to a diatonic note of the scale (as in the minor mode), or it may rise a semitone to a diatonic note of the scale, which would be impracticable in the minor mode. Now, a note with a tendency to fall produces one effect, and a note with a tendency to rise produces another, wherefore, each of the superior tetrads is available for use as two distinct chords, and it is desirable that each should have a distinct name, and (if possible) distinct notation, features which are alone obtainable by an enharmonic change within the tonality. Such an enharmonic change,—which is peculiar to the major mode, it may be here said, occurs also in connection with the only other chord, the notes of which are equi-distant, namely the chord of the augmented fifth, which may thus become a chord of the minor sixth (see Chapter XXIII).

Composers frequently employ a superior tetrad and resolve it chromatically, it must be admitted, instead of an inferior tetrad which might be resolved diatonically; but there is a strong tendency at the present day to systematize the whole question of notation, and to adopt, as far as possible, the natural law that chromatically raised notes should rise, and chromatically lowered notes should fall in resolution; a law of art, be it said, which is in accordance with the laws of science.

241. Of all the fundamental chromatic discords, the diminished tetrads are the most important, not only on account of their more frequent employment, but also from their more extensive use in enharmonic modulation. The general treatment of these chords has been explained in Chapter XIV, and it will suffice, therefore, in the present connection, to exemplify only their more usual resolutions as chromatic chords.

As with the preceding chords, the diminished tetrad derived from II, xIV_{70} (the diminished tetrad on the interdominant) is the most popular of these chords; it plays a very important part as a pre-cadential chord, but it often gives place to its enharmonic

equivalent, $\times II_{70}$ (the diminished tetrad on the hyper-supertonic), in the major mode only, of course. At (a) $\times IV_{70}$ resolves upon V_7 ; at (b), it resolves upon a cadential six-four; but the chord at (c) $\times II_{70}^1$, may be employed instead of $\times IV_{70}$ in the progression at (b):

(a) (b) (c)

$\times IV_{70}$ $\times IV_{70}$ $\times II_{70}$

The chord at (c) is preferable to that at (b), in the above progression, because, as the melodic tendency of the note is to rise, it is more natural to employ a sharpened than a flattened note; moreover (to the musician) the melodic interval of a minor second, rather than that of an augmented prime, seems to be suggested; whether this be so or not, the fact remains that the notation at (c), rather than that at (b), is in accordance with the trend of modern harmony.

242. The diminished tetrad on the mediant, III_{70} , is exemplified at (a), where it resolves upon V_7 , but, for the reasons advanced in § 241, the enharmonic equivalent of this chord, $\times I_{70}^1$, as shown at b, may be employed instead; at (c), III_{70}^2 is resolved upon the derivative of II_{+7} ($\times IV_0^1$) which is treated as a precadential chord:

(a) (b) (c)

III_{70} $\times I_{70}^1$ III_{70}^2

Lo_7 , and its enharmonic equivalent $\times V_7o$, may be treated on similar lines, examples of their use, therefore, are not necessary. The one general rule, applicable to chromatic notes, to which adherence should be given, and to which there are but few exceptions, is, that chromatically raised notes must rise in resolution and chromatically lowered notes must fall, or in terse language, "sharps up and flats down."

In the minor mode, the superior diminished tetrads only, as was said above, are employed, and as they are resolved in practically the same manner as the same chords in the major mode, it would be superfluous to exemplify their use.

243. The diminished tetrads may also be resolved upon one another, a regular succession of such resolutions resulting in four simultaneous chromatic scale passages, either ascending or descending, as in the following example. Such progressions, though not infrequent in instrumental compositions, are rarely employed in vocal music. The inferior tetrads, it will be seen, are employed in ascending, and the superior in descending:



Consecutive fifths, it may be said, in proceeding to a diminished tetrad, do not produce a bad effect, as a perfect fifth is foreign to the character of these chords.

In addition to the chords which have been considered above, there are other diminished tetrads which occur as *fortuitous* chords, in which neither generator nor root play any part; these chords, together with the subordinate diminished tetrads, will be considered in Chapter XXII. The enharmonic changes, of which the diminished tetrad is susceptible, were partly explained in Chapters

XIV and XVIII, but this subject will be considered in detail in Chapter XXIII.

244. **The frequency of occurrence** of an ordinate chromatic chord may be determined from its most intense constituent interval, as shown in the following table:

Intervals in the order of intensity									
Interval Inversion	3 ^o 6 ^x	2 ^x 7 ^o	4 ^o 5 ^x	4 ^x 5 ^o	2 ⁻ 7 ⁺	3 ⁺ 6 ⁻	2 ⁺ 7 ⁻	4 ⁺ 5 ⁺	3 ⁻ 6 ⁺
Frequency of occurrence	5	6	7	9	10	11	13	14	15

An example will illustrate the application of the above table. The intensity, that is to say, rarity of occurrence, of a diminished fifth (5^o) and its inversion (4^x) is represented by the figure 9, indicating that both of these intervals occur nine times in any given tonality or key; and since 5^o is the most intense interval in a primary tetrad, it follows that there are nine different primary tetrads in any given key, and, consequently, that any given primary tetrad occurs in nine different keys. In like manner, there are six diminished tetrads in every key, and, as will be duly explained in Chapter XXII, seven augmented triads, and five chords of the augmented sixth, etc.

245. **Secondary chromatic tetrads** are of comparatively rare occurrence. II₀₇, the supertonic tetrad of the affinitive minor mode, is the most popular of these chords; it is frequently employed as a pre-cadential chord, and generally in its first inversion, as at (a). IV₋₇ and IV₋₇₋, as exemplified at (b) and (c), respectively, may also be mentioned as chords in occasional use:—

(a) (b) (c)

6 8 7 7 6 7 b7 6 8 7
 5 b b 4 3 b 5
 IIo7¹ IV-7 IV-7

Secondary chromatic pentads are of even rarer occurrence, and when employed they should be treated as modified tetrads, the ninth being regarded as either a suspension or an auxiliary note. Derivatives of secondary pentads are not generally recognized; even though the tetrads at (b) and (c) above, may be regarded as derivatives of the secondary pentad on II, yet it is preferable to regard them as natural and not as artificial tetrads, so that the term "artificial tetrad" may be applicable to a derivative of a primary pentad only, and to a chord, therefore, in which the fifth of the (nominal) root is essentially a diminished fifth. Neither secondary chromatic tetrads or pentads play more than an insignificant part in the minor mode. With regard to the use of these exceptional chords in both modes, it may be said, that experience alone will enable the student to introduce them with good effect, and until he is assured that their use is desirable and justifiable, he will be well advised to regard them in the light of dubious attempts to obtain extreme effects in tonal color.

SUMMARY

- § 230. The classification of fundamental chromatic discords. Tetrads, pentads and their derivatives. The table on page 49 should be committed to memory.
- § 231. The supertonic primary tetrad. The seventh of this chord (the tonic of the key) more free than the seventh in any other tetrad.

- § 232. The tonic primary tetrad.
False relation in proceeding to and from primary fundamental discords not objectionable.
- § 233. The derivative of the primary tetrad.
Its first inversion an important chord.
- § 234. Other ordinate chromatic primary tetrads.
General resolutions – to V_7 , to I , or to another chromatic chord.
- § 235. The primary tetrads of the minor mode.
- § 236. The origin of the chromatic element in music.
The superior and inferior primary pentads, more valuable from a scientific than from an artistic standpoint.
- § 237. The major and minor primary pentads.
General treatment the same as V_9 .
- § 238. The derivatives of minor pentads.
Known as artificial tetrads to distinguish them from natural or fundamental tetrads.
- § 239. The minor tetrads.
Care necessary to distinguish between these chords and Π_{07} of the minor mode.
- § 240. }
§ 241. } The diminished tetrads.
§ 242. }
§ 243. }
- The three superior tetrads, and their enharmonic equivalents, the three inferior tetrads.
- § 244. The frequency of occurrence of chromatic chords.
Table of intensity of intervals.
- § 245. The secondary chromatic tetrads and pentads.
 Π_{07} , the most important. Derivatives of secondary pentads not generally recognized.

EXERCISES


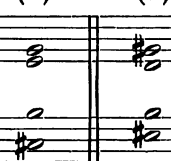
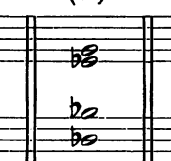
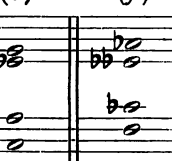
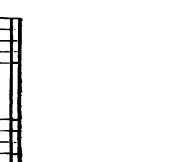
I

1. Classify the natural tetrads, both diatonic and chromatic, and give an example of each chord with its ordinary resolution.
2. Explain the artificial tetrads. In what respect do their resolutions differ from the natural tetrads?

3. Classify pentads and their derivatives.
4. Write and resolve, employing the note *E* (third space in the bass) as the root in each case: (a) a primary diatonic tetrad, (b) a secondary diatonic tetrad, (c) a primary chromatic tetrad, (d) a secondary chromatic tetrad, (e) a chromatic minor tetrad, and (f) a chromatic diminished tetrad.
5. Mention any exceptions in connection with the resolution of the primary chromatic tetrad on the supertonic.
6. Give three different examples of false relation, the effect in each case being good. Give one example with bad effect.
7. Explain the harmonic source of the tonal material of (a) the minor mode, and (b) the major mode.
8. Give reasons for the existence of the inferior diminished tetrads in the major mode, and state why they are not available in the minor mode.
9. Write and resolve the diminished tetrads in the key of *A* minor; then write and resolve them as the inferior diminished tetrads in *C* major.
10. Explain the principle by which the frequency of occurrence of chromatic discords may be determined.
11. Enumerate the chromatic triads and tetrads which naturally occur in the major-minor mode.
12. Explain, and exemplify the use of, secondary tetrads and pentads.

II

13. Name the three major keys to which each of the following chords belongs as a superior tetrad:

(a)	(b)	(c)	(d)	(e)	(f)
					

14. Introduce and resolve each of the above chords as a (pre-cadential) supertonic discord.

15. Complete the following passage by inserting the chords indicated by the symbols. Figure the bass.

(a) (b) (c) (d)

(e) (f) (g) (h) (i)

16. Analyze the following chords, as chromatic discords in the key of A major:

(a) (b) (c) (d) (e) (f) (g) (h)

17. Add alto and tenor parts to the following exercise:

9 -b7 9 -b7 9 8 7 - 9 8 9 b7 b9
7 - b7 - 7 - 6 5 7 - 7 b7 b7
4 #3 4 3 # -

- $\flat 9$ 4 3 6 - 7 $\flat 4$ 4 $\sharp 6$ $\flat 6$ $\sharp 6$ $\flat 9$ $\flat 4$ 3
 7 $\sharp 2$ 4 4 - $\flat 7$
 7 $\sharp 2$ 3 $\flat 4$ -

7 6 6 6 $\sharp 6$ 8 - 4 5 6 9 6 7 6 $\sharp 7$ $\flat 7$
 5 - 5 5 6 7 \flat 7 \sharp $\flat 5$ 4 $\flat 6$
 \flat - 4 2 7 \sharp 2

18. Add treble, alto and tenor parts to the following:

$\sharp 4$ $\flat 7$ \sharp $\sharp 8$ 9 $\sharp 7$
 2 \sharp 7 \sharp

4 6 \sharp $\sharp 5$ 4 $\sharp 6$ 6 7
 2 5 $\sharp 5$ 3 4 4 4 3
 2 3

19

$\flat 7$ $\sharp 6$ 6 5 $\flat 7$ 5 - 5 $\sharp 6$ 6 $\sharp 6$ 6 7 7 4 3 -
 4 3 2 4 $\sharp 4$ 2 $\flat 5$ $\sharp 5$ 4 - \sharp
 2 -

b5 7 b7 b7 6 8 7 9 8 - b5 4 b6 6 6 8 7

 4 #3 - #2 4 4 5 6 5

20

9 8 #7 8 7 #4 #7 #4 6 - 6 #6 5 6 #5 7
6 5 4 5 #5 b 4 3 4 # #
4 3 2 3

21. Write a *real* sequence (rising major seconds), employing the following model; repeat the model three times, and add a short coda ending in the original key.

A musical score for the song 'The Rose Tree'. It features a treble and bass staff with a key signature of one sharp (F#) and a 6/8 time signature. The melody is written in the treble staff, and the bass line is in the bass staff. The music is in common time (C) and features a simple, folk-like melody with a repeating bass line.

22. Clothe the following blank rhythm with harmony, in the key of A, employing the chords indicated by the symbols:

I I_{7o} I II+7² V₇ I I₉₇₋ IV_x II_{7o}¹ I² II+9- V

I III_{7o}² xIV_o¹ I² xV_{7o} IV¹ II+9 V₇ VI xIV_{7o} V₈₇ I

III

Harmonize the following basses:

23

24

Harmonize the following melodies:

25

26



29. Compose a Hymn tune in 7.7.7.7. metre, in the key of *D* flat, introducing the following chords:

(a) (b) (c) (d) (e) (f) (g) (h)



30. Write a musical sentence in the key of *F* sharp minor, introducing various chromatic discords.

CHAPTER XXI

DIATONIC MODIFICATIONS

246. The principle upon which chords have been constructed hitherto has been that of the super-imposition of thirds, resulting in the addition, within the limits of an octave, of the third, fifth and seventh to a given root. Diatonic modifications arise from the use of the second, fourth and sixth of the given root. Thus, the complete diatonic material of the scale, under certain conditions, now becomes available for use in relation to a given root.

Modified discords are the result, in general, of either "displacements" or "additions."

Displacements may be either *temporary* or *absolute*; the former, generally called suspensions, have been considered in Chapters XV and XVI; the latter, now about to be considered, occur chiefly in connection with the dominant chord, and comprise

V₂, the dominant second, in which the third is displaced by its lower auxiliary note;

V₄, the dominant fourth, in which the third is displaced by its upper auxiliary note; and

V₆, the dominant sixth, in which the fifth is displaced by its upper auxiliary note.

The absolute displacement of the fifth by its lower auxiliary note is not an accepted modification, wherefore, the symbol V₄ is not ambiguous.

Additions, other than the added sixth of the root, which, in relation to the triad on IV, was explained in Chapter XII, §115, are of rare occurrence.

247. **The dominant second, V₂**, has already been briefly considered in Chapter XIII, § 123. If the second in this chord rises to L, then L is but *temporarily* displaced, and the chord becomes simply V or V₇, as the case may be, with L treated ornamentally; the chord becomes an *independent* chord only when L is *absolutely* displaced.

V_2 differs from V_9 in three particulars, (1) the second naturally rises while the ninth, being a fundamental dissonance, naturally falls; (2) the second may appear at the interval of a second above the root, which is strictly forbidden in the case of the ninth; and (3) the seventh is not an essential note, as in the case of V_9 . Furthermore, L must never be present in this chord, whereas in V_9 it should rarely be absent.

In resolving these chords, V_2 , V_4 and V_6 , the displacing note, as a general rule, should proceed to that note to which the displaced note would naturally proceed; in V_2 , therefore, the second usually skips up a third to the tonic, as at (a) and (b). It is customary to include the seventh in this chord, but it may be omitted, as at (c). The chord at (d), may be regarded from three standpoints, as V_2 with the second falling, as V_9 with L omitted, or as a passage of chords of the sixth on a dominant pedal.

(a) (b)

(c) (d)

6 7 6 7 6 5
4 2 V₂ 2 V₂

2 4 6 9 8 7
V₂ 7 6 5
5 4 3

248. **The dominant fourth, V_4** , compared with V_2 and V_6 , is of rare occurrence. The fourth has such a strong tendency to resolve upon the third, that any failure in this respect may result in disappointment; and when this resolution takes place, the chord becomes simply V or V_7 , with the third treated ornamentally. This chord, however, *may* be employed with the natural resolution withheld, the third being absolutely displaced, and it must then be regarded as an *independent* chord.

It is desirable to prepare the fourth in this chord, when this note remains stationary in resolution, in which case the fourth may be regarded as an inverted pedal, as at (a); at (b), the chord is in its second inversion, with the fourth unprepared; at (c) the seventh is omitted; and at (d) the inverted fourth is in the bass.

(a) (b)

6 7 6 7
4 4 4 3
 V_4 V_4^2

(c) (d)

6 4 4 5
 V_4 V_4^1

249. **The dominant sixth, V_6** , is the most popular of these modifications. Reference to this chord will be found in the Introduction, page 369, (Part III), and the explanation there given may be read in connection with the present section.

Unlike V_2 and V_4 , the displacement is confined almost exclusively to the treble part, it may, therefore, be regarded as a melodic embellishment. As with the preceding chords, the seventh of the root is generally included, but if it be not present, care must be taken not to confuse this chord with III^1 , the notation and figuring of both of these chords being the same. There should be little or no confusion in this respect, however, for, III^1 is rarely employed except in sequences, while V_6 is rarely employed except in connection with the perfect and deceptive cadences.

In resolving the chord, the sixth naturally falls to I, as at (a) and (b); but it may remain stationary as at (c), where the seventh is omitted; or it may rise to V, as at (d).

(a) (b)

6 8 7 #6 4 7
5 6 - 4 6
V₆ - 3 V₆

(c) (d)

7 6 4 6- 6
V₆ V₆

If the sixth in this chord is immediately preceded or followed by the fifth of the root, the chord becomes simply V or V₇, as the case may be, and ceases to be an independent chord. In fact, it is more than probable, that V₆ arose, in the first instance, from the constant use of the sixth as an *auxiliary* note, in an endeavor to impart variety to the stereotyped form of the perfect cadence.

V₆ is rarely employed in other than root position, but should it be inverted, the seventh, if present, should not be placed above the sixth.

250. These modified dominant chords are also available for use in the minor mode, special importance being attached to V₆-. The second in V₂ is necessarily a *major* second above the root, as in the major mode; and herein is to be seen yet another point of difference between this chord and V₉, for the ninth is always minor in the minor mode. Neither V₂ nor V₄, however, are of frequent occurrence in the minor mode.

Reference to V₆- will be found in Chapter XVIII, § 206; also in the Introduction, page 369, (Part III), where the chord is considered at some length; and further reference will be made to this chord in Chapter XXIII, in connection with enharmonic modulation. V₆- is a chord which has given rise to much controversy. By some authorities, its use in counterpoint (under certain conditions, L being omitted) is advocated; by others, its use is forbidden altogether, or forbidden in simple counterpoint and accepted in double. Bach, it may be said, did not hesitate to employ the chord (in its complete form) even in triple counterpoint. Various reasons may be advanced to account for the position which this chord occupies in both harmony and counterpoint. In the first place, unlike V₆ in the major mode, and notwithstanding that it is under consideration in the present chapter, it is a *chromatic* discord, for, it comprises the chromatic interval of a diminished fourth. Secondly, although this dissonant interval is present, yet each of the upper notes is *consonant* with the bass, in this respect resembling L¹, which is also a discord, but which, nevertheless, is freely employed in counterpoint; the diminished triad, however, is a dia-

tonic chord. And thirdly, the chord possesses a certain *æsthetic* character, peculiar to itself, of intense sorrow, which, if for no other reason, definitely establishes its position in harmony; and thus being an accepted chord, and a chord of the sixth withal, it can readily be seen why its use might be advocated in counterpoint; chromatic chords, however, are contrary to the principles of strict counterpoint, while the question of an æsthetic character, it may be added, does not enter the realm of this prosaic branch of composition.

The treatment of V_6 in the minor mode is practically the same as that of V_6 in the major mode, and illustrations of its use may be obtained by transcribing to the minor mode the progressions in the example in § 249.

251. **Doubly modified chords**, in which two consonant notes are absolutely displaced, though available for use, are of very rare occurrence. The following example illustrates the use of the combined second and sixth on the dominant, V_6^6

7 7
6
2
2
 V_6
2

The modifications, which have been explained above, are occasionally employed upon notes other than the dominant, but in connection with primary tetrads rather than with triads; they will, therefore, be considered in the next chapter under chromatic discords.

With the exception of V_6 in both modes, which may be freely employed, the student is advised to exercise much care in the use of these diatonic modifications; in fact, their presence in compositions should alone be justified by their aptness to portray some particular effect. It is imperative that the *strict* use of auxiliary notes, as explained in Chapter XVII, be mastered, before the *free* use of the same, as explained in the present chapter, is adopted; and especially is this the case at examinations, when the question of a thorough academic training is the real object at stake.

252. Diatonic modifications, arising from the use of the second, fourth and sixth of the root as **additions**, as was stated above, with the exception of the added sixth, are of rare occurrence. When employed, it is desirable, in order to avoid extreme harshness, that there should be the interval of a major second between the added note and each of the approximate notes; hence, the added second usually occurs in connection with major triads, and the added fourth in connection with minor triads. These chords will be considered further in Chapters XXVI and XXVII.

The symbols for "additions" are formed by underlining the figure employed to represent the added note, I_6 , for example, being the symbol for "the added sixth on the tonic."

The added sixth, theoretically, may be employed in connection with any consonant triad, but its use is chiefly confined to the cadential triads only, I, IV, V and VI, in both modes. IV_6 has already been explained in § 115, where it was shown that this chord and II_7^1 were equivocal chords; care must be taken, therefore, not to confuse the chord of the added sixth on other roots with the first inversion of the secondary tetrad on the third below. The context will determine the character of the chord, for, the added sixth, as its name implies, impresses the ear as being an auxiliary note *added* to a triad, and not as a new root, converting the *consonant fifth of a triad* into the *dissonant seventh of a tetrad*; the chord of resolution will definitely prove the significance of the progression.

The following examples illustrate the use of the chords of the added sixth on I, V and VI; it will be seen that no suggestions whatever of secondary tetrads are implied:—

(a)

5 6 5 1₆ - 7 6 5

(b) (c)

6 6 9 8 7 8 7 6 5 - 3 2 6 3 6 5 - 6 7 6 7 - 4 3
V₆ VI₆

253. The added second and sixth are also available for use as free melodic auxiliaries; but the fourth is rarely treated in this manner. Thus, at (a) the added second proceeds by disjunct movement; and at (b) the added sixth is treated on the same lines.

(a) (b)

7 8 4 4 6 6 4 3 7 - 6 - 3 2 2 5 - 6 5

Another form of free treatment which is occasionally accorded to the second, fourth and sixth, in the works of classical composers, is that which may be termed the "deceptive auxiliary." At (c), (d) and (e), these notes are respectively treated as deceptive passing notes; that is to say, the auxiliary note, in each case, might have proceeded conjunctly to a consonant note in the succeeding chord, whereas it moves disjunctly to another consonant note, thus *deceiving* the ear.

(c) (d) (e)

8 9 6 4 6 6 3 4 6- 5 6 7 -
3 - 3 5 3 4 3 4 3 - 2 3

The deceptive anticipation, exemplified at (f), is another instance of free treatment of an auxiliary note.

(f)

6 6 5 6
4 4 -
2 -

No definite laws, apparently, have ever been laid down in respect to the free treatment of auxiliary notes, but the following rules, formulated from examples of their use, comprise the general principles upon which these melodic progressions are based: (1) the auxiliary note should appear in the treble part only; (2) it

should occur in relation to **primary triads only**; (3) it should be approached conjunctly; and (4) it should be heard either upon a weak beat or in between beats. While, it may be added, there is at the present time, apparently, an unwritten law to the effect that disjunct movement may be employed after any auxiliary note that is approached conjunctly. The student, however, will be well advised not to let *any* auxiliary note move disjunctly, with the exception of "changing" and "turning" notes only, as explained in Chapter XVII.

254. There is a tendency on the part of modern composers to develop to the fullest all the possibilities in connection with diatonic auxiliary notes; in fact, this tendency has become more or less a necessity in order that originality of tone combination may be obtained within a given tonality, without recourse to the chromatic element. The exceptional treatment of auxiliary notes, however, is employed in instrumental rather than in vocal compositions, but the future may see a change in this respect, for, modern composers do not hesitate to regard and treat the human voice in the light of a "vocal instrument," to a far greater extent than did their predecessors. In this connection, a word of caution to the modern student may not be out of place. Although, in a treatise of this character, it is necessary to consider and explain these exceptional harmonic and melodic progressions, in order that the student may be in a position to appreciate and analyze modern scores, yet it is not necessary for him to introduce them into his own early attempts at composition. Experience alone will teach him when they may be employed with good effect, and, until this experience has been acquired, it will be advisable for him to imitate the pure and simple style of the older masters rather than try to emulate the extravagant progressions occasionally indulged in by ultra-modern composers.

SUMMARY

§ 246. Modifications generally.

Displacements and additions; V_2 , V_4 , V_6

§ 247. The dominant second.

Difference between V_2 and V_9 .

§ 248. The dominant fourth.

The fourth usually treated as a pedal note.

§ 249. The dominant major sixth.

The most important of the modified chords; the sixth regarded as a melodic embellishment.

§ 250. The dominant minor sixth.

Its historic interest. The treatment of V_2 , V_4 and V_6 , practically the same in the minor as in the major mode.

§ 251. Doubly modified chords.

Available for use, but of rare occurrence.

§ 252. The added sixth.

The most important of the additions; its use on notes other than IV.

§ 253. Deceptive auxiliaries.

Occasionally employed by composers, but not recommended for use by students.

§ 254. Modern tendencies.

A word of caution to the student.

EXERCISES

I

1. Explain the meaning of the terms "Displacements" and "Additions" as employed in connection with modified chords.
2. Mention the points of difference between the dominant second and the dominant ninth.
3. Classify the notes of the diatonic scales from the standpoint of their melodic tendencies; and show that by their very nature, the tonic and mediant are not available as fundamental dissonances in relation to the dominant as a generator.
4. Write and resolve the chord of the dominant fourth in the keys of *A* flat major and *C* sharp minor.
5. Write and resolve the chords of the dominant major and minor sixths in the keys of *E* major and *F* minor respectively.
6. Give examples of the "Added sixth" on roots other than the subdominant.

7. Exemplify the use of the second and sixth as free melodic auxiliaries.

8. Describe the deceptive auxiliary note.

II

9. Introduce and resolve the following chords. Commence with the tonic and end with the perfect cadence in each case, employing not more than four or five chords.

(a) (b) (c) (d) (e) (f)

10. Complete the following passage by inserting the chords indicated by the symbols. Figure the bass.

(a) (b) (c) (d) (e) (f)

11. Add alto and tenor parts to the following exercise:



6 #7 6 7 4 3 - #5 - 5 - - 5 - 8 #7 8 5 -
 4 2 - 5 3 b4 3 - - b3 4 5 - #5 3 4
 3 #3 3 2 3



6 6 6 7 - 7 6 7 7 7 #7 4 3 2 3
 5 5 2 4 2 2 # 4

Add treble, alto and tenor parts to the following:

12



89 56 65 87 7- 9- 5#8
 34 4- 3- 32 75 4-



87 56 65 87 6- 6 76 6- 98
 6- 34 4- 6- 34 #4- 32 76
 3- #- 2- 3-



76 75 5- 86 - 6 87
 4- #2- 34 7- 5 6-

I3



9 8 6 8 — 6 5 6 6 6 5 6 — —
 7 7 — 3 3 3 4 — 4 — 3 —

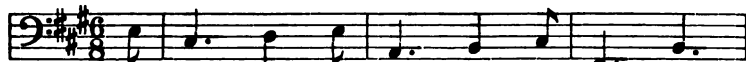


6 8 7 9 8 6 b9 8 6 6 b7 8 — 6 7
 5 2 — 7 7 — 7 7 — 5 — 3 3 3



7 7 b7 b7 b7 b7 b5 b 6 6 9 7 6 6 9 8 7
 2 4 b4 b4 b5 b4 4 7 5 4 7 5

I4



5 7 6 9 5 7 6 9 9 8 7
 # — 7 3 — 7 # 7 6 5



4 #3 #5 # — 5 — 6 4 3 #4 5 — 6 4 3 7
 # 2 — # 2 2 — #

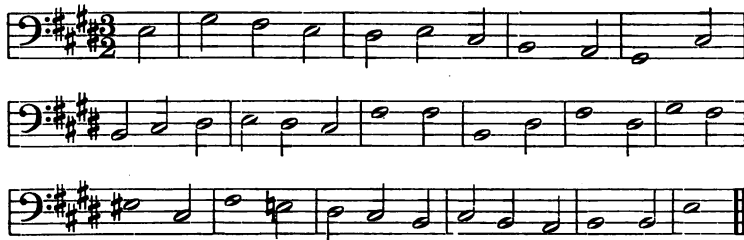


6 5 6 5 7 6 3 — 6 7 5 — # —
 4 — #3 — 4 5 4 #2 —

III

Harmonize the following basses:

15



16



Harmonize the following melodies:

17



18



19



20



21. Compose a short metre Hymn-tune, in the key of *G* flat major, introducing the following chords:

(a) (b) (c) (d) (e) (f)



22. Write a musical sentence in the key of *C* sharp minor, introducing various diatonic modifications.

CHAPTER XXII

CHROMATIC MODIFICATIONS

255. The subject about to be considered constitutes the final stage in the development of chord construction. Chromatic modifications, it may be said, are practically illimitable, and in the present chapter, therefore, the use of the more important chords only will be explained; chords which arose in the first instance, probably, as the result of experiment, but which, from constant use, are now regarded as being definitely established. Namely,

1. **The chord of the augmented sixth;**
2. **The augmented triad;**
3. **The diminished triad;**
4. **Tetrads** modified by *displacements* and *additions*;
5. **Fortuitous chords**, etc., arising from the use of auxiliary notes.

These chromatic modifications will now be considered in the above order.

256. Reference to the chord of the augmented sixth has already been made in Chapter XVIII, § 208, where the three forms of this chord, commonly called the **Italian**, the **French** and the **German**, were exemplified in their *normal* positions on -VI of the scale. Further reference to this chord will be made in the succeeding chapter in connection with the subject of enharmonic modulation. Before considering these chords from the fundamental standpoint, it may be of interest to glance at their probable historic origin. It may be presumed, from the progression at (a) which is of common occurrence in counterpoint, that the Italian form of the chord, doubtless the oldest of the three forms, arose about the time that the chromatic element was first introduced into music. The use of the chromatic passing note in the bass at (b) on one occasion, and that in the treble at (c) on another, might readily suggest that they be combined as at (d) which is the normal Italian sixth in the key of C:—

(a) (b) (c) (d)

$\begin{matrix} 6 \\ \text{IV}^1 \end{matrix}$ V $\begin{matrix} 6 & 6 \\ \text{IV}^{-1} \end{matrix}$ $\begin{matrix} 6 & \#6 \\ \text{xIVo}^1 \end{matrix}$ $\begin{matrix} 6 & \#6 \\ \text{VI}_6 \\ (\text{It.6}) \end{matrix}$

When harmony arose, it was but natural that the gap between *C* and *F* sharp would suggest the addition of another note to the chord; the note midway between, namely *E* flat, was probably the first to be added, and the chord became known as the German sixth, which, in order to avoid consecutive fifths, resolves upon a cadential six-four, as at (e). Finally, it may be presumed, the note *D* was introduced (instead of *E* flat), and the chord became known as the French sixth, which may resolve either upon a cadential six-four, or as at (f) upon the dominant chord:

(e) (f)

$\begin{matrix} \#6 & \#6 & \#6 \\ \flat 5 & 4 & 4 \\ & 3 & 3 \\ -\text{VI}_6\text{x} & & -\text{VI}_6\text{x} \\ 5 & & 4 \\ (\text{Gn.6}) & & (\text{Fr.6}) \end{matrix}$

The Italian sixth probably came into use about the year 1600, the German about 1700, and the French about 1800.

These chords of the augmented sixth, therefore, upon the above assumption, may be regarded as IV^{-1} (the first inversion of the minor triad on the subdominant), whether the key be major or

minor, with the sixth chromatically *displaced*, and in the case of the French and German forms, with the fourth (augmented) and the fifth (perfect), respectively, also *added*.

257. As the natural function of the chords of the augmented sixth on -VI is to prepare the way for the dominant chord, so the *fundamental source* from which their constituent notes are obtained is the great precadential generator, the *supertonic*, which furnishes — among others — the two important discords exemplified at (a) and (b), the former a primary chromatic pentad, and the latter a secondary chromatic tetrad.



By discarding the *A* natural of the first chord, and the *F* natural of the second, and employing instead of these notes their chromatic displacements, *A* flat and *F* sharp, the chord at (c) is obtained which comprises the notes of the three chords under consideration. But notwithstanding their common scientific origin, each form of the augmented sixth is regarded and treated as an independent chord, with its own distinctive root; should all three forms occur successively, however, as in the following example, it is unnecessary to regard them as three separate chords, as the first chord determines the effect upon the ear, the succeeding positions being supplemental melodic ornamentations. Thus, the chord at (d) is the Italian form, the note at (e) is a diatonic passing note, and that at (f) a chromatic passing note; indeed the note at (f) is frequently written as *D* sharp, when it becomes distinctly a chromatic auxiliary, for, the interval *A* flat to *D* sharp (a doubly augmented fourth) is altogether contrary to the principles of chord construction.

(d) (e) (f)

#6 $\frac{4}{3}$ $\frac{b6}{4}$

-VI_{6x}
(It.6)

258. In considering the question of the root of these chords, a complex problem presents itself. Even though the supertonic be accepted as their common *generator*, yet the minor submediant is regarded as their *nominal* root; while there is, furthermore, what may be termed the *apparent* root. This apparent root, in the case of the French sixth, is invariably II. In the case of the Italian sixth, this root may be either IV (the chord being IV⁻¹, with the root chromatically raised) or xIV, generator II (the chord being xIV_o¹, with the bass chromatically lowered). In the case of the German sixth, this root may be either -VI (the chord being -VI₊ with 6_x added) or xIV, with generator II (the chord being xIV_{7o}¹ with the bass chromatically lowered). In order to avoid unnecessary complications, it is desirable to regard the normal bass-note as the nominal root, for the inversions of these chords are calculated from this note; to refer to the generator only when the chords are under analysis; and to employ the apparent root simply in order to justify the chromatic modifications.

In respect to -VI as a root, it may be added that special importance is attached to this chromatic note; in the first place it is the only chromatic note obtained from the dominant, the most important of all generators; secondly, it is available for use as the fifth of the supertonic equally with +VI; and thirdly, it may be regarded as the connecting link between the major and minor modes, as explained in §221.

259. Although in the natural resolution of these chords -VI falls and xIV rises, each a diatonic semitone (2-) to the dominant of the key, as was exemplified in § 256, yet several other resolutions are also available, the most important of which are illustrated in the following example, in relation to the Italian form of the chord:

	(a)	(b)	(c)	(d)	(e)
#6		#7	#6 4 2	#6	#6 4 3
-VI _{6x} (It. 6)	V	V ₇	L7 ₀ ^a	xIV ₀ ¹	II ₇ ^a

	(f)	(g)	(h)	(i)	(j)	(k)
#6 b5	7 #	6 4	#6	#6		
xIV ₇₀ ¹	II ₇ ⁺	I ₂	IV ₇ ¹	IV ₁ ¹	I	

The French and German forms of the chord may also be resolved upon the same lines. It should be noticed that the two notes forming the augmented sixth rarely proceed by similar motion; the resolutions at (b) and (k) are not often employed, and they should be avoided altogether when the characteristic interval (6x) occurs in the extreme parts.

260. Each form of the chord of the augmented sixth is susceptible of inversion, the Italian having two, and the French and

German each three inversions. As the normal position is regarded as the root position, so the inversions are calculated from $-VI$, as the original bass note. These chords and their inversions are illustrated in the following example, the Italian at (a), (b), (c), the French at (d), (e), (f), (g), and the German at (h), (i), (j), (k):

The image displays musical notation for the inversions of the $-VI$ chord in three styles: Italian, French, and German. Each style is shown with four examples (a-k) on a grand staff (treble and bass clef).

Italian Style (a, b, c):

- (a) Treble: $\sharp G$, Bass: $\flat G$. Label: $\sharp 6$
- (b) Treble: $\sharp G$, Bass: $\flat A$. Label: $\flat 6$, $\sharp 4$
- (c) Treble: $\flat G$, Bass: $\sharp G$. Label: b

French Style (d, e, f, g):

- (d) Treble: $\sharp G$, Bass: $\flat G$. Label: $\sharp 6$, 4 , 8
- (e) Treble: $\sharp G$, Bass: $\flat A$. Label: $\flat 6$, $\sharp 4$, 2
- (f) Treble: $\sharp G$, Bass: $\flat A$. Label: 7 , $\flat 5$, \sharp
- (g) Treble: $\flat G$, Bass: $\sharp G$. Label: 6 , 5 , b

German Style (h, i, j, k):

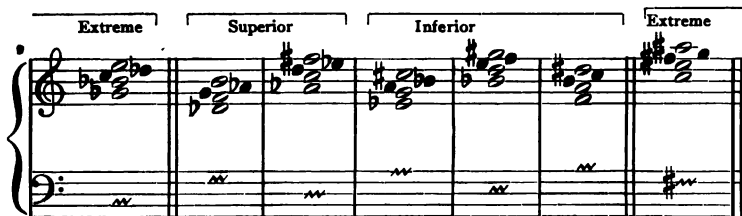
- (h) Treble: $\flat G$, Bass: $\flat G$. Label: $\sharp 6$, $\flat 5$, $-VI_{6x}$, 5 , (Gn. 6)
- (i) Treble: $\flat G$, Bass: $\flat A$. Label: $\flat 6$, $\sharp 4$, b
- (j) Treble: $\flat G$, Bass: $\flat A$. Label: $\flat 4$, $\sharp 2$
- (k) Treble: $\flat G$, Bass: $\sharp G$. Label: $\flat 7$, b

The inversions, as compared with the chords in their normal position, are of rare occurrence, and it is desirable, when they are inverted to avoid as much as possible the interval of a diminished third, the use of which has been forbidden altogether by some authors; this interval, however, necessarily occurs in the last in-

version of each chord, to which, especially in the case of the German sixth, no objection has been made by modern composers.

Care must be taken not to confuse the figurings employed for these chords with those employed for tetrads and their inversions, with which they are identically the same. Should the third inversion of the German sixth, for example, occur in the minor mode, the figuring would be simply 7, but that the chord is not a tetrad is evident from the presence of the diminished third, an interval foreign to the formation of all fundamental discords.

261. The Italian, French and German forms of the augmented sixth are obtainable also from other generators, namely V (the most important) and VI, III and L. These chords, when derived from II and V, as generators, are called the superior augmented sixths; when derived from VI, III and L, they are called the inferior augmented sixths. A regular series of chords is thus obtainable, with the generators rising successively by perfect fifths, as in the case of primary tetrads and pentads; and this series may be extended, on either side, so as to include what are called the extreme chords of the augmented sixth, as illustrated in the following example:



The superior and the inferior chords are both available for use in the major mode, but the former are of more frequent occurrence, and the former alone are employed in the minor mode. The constituent notes of the superior and inferior chords comprise the complete modern enharmonic scale of C. The extreme chords, here, as in other cases, are not recommended for general use; they form the connecting links between the tonic and the subdominant keys on

the one side, and the tonic and the dominant on the other, and their use might, therefore, be justifiable if the subdominant and dominant chords, respectively, were prominently employed.

262. The various forms of the augmented sixth and their inversions on -II, -III, IV and VII, may be resolved upon the same lines as those upon -VI; but the chords on -II usually resolve upon the tonic chord, while the others usually resolve upon the dominant. It would hardly be practicable to exemplify all the resolutions of these chords and their inversions, nor would any special purpose be served by attempting to do so. The following passage will be sufficient to illustrate the general use of these chords:

(a) (b)

6 4 4 3 4 #6 4 $\flat 5$
3 2 3

-II \times -VI \times
(Fr. 6) (It. 6) (Fr. 6) (Gn. 6)^{*}

(c) (d) (e)

$\sharp 6$ 5 6 $\sharp 6$ $\sharp 6$ $\flat 6$ 7 6 6 6 $\sharp 6$
4 3 - 3 $\flat 5$ 4 3 $\sharp 4$ $\sharp 4$ 5 5
5 5 5 5 5 5 5 5 5 5

-III \times VII \times IV \times
(Gn. 6) (Gn. 6) (Gn. 6)

It will be seen that the chords are introduced in the natural order of roots rising by successive perfect fifths, as in the preceding example, that each form has been included, and that some of the chords are inverted. The chord at (e), as here employed, may also be regarded as a chromatic modification of the added sixth.

263. In addition to the Italian, French and German forms of the augmented sixth, three other forms, exemplified at (a), (b) and (c), are in occasional use:



The chord at (a), with the major third of the root present, is an augmented sixth proper, and may be regarded as an enharmonic modification of the German form; it is employed in the major mode only, and naturally proceeds to a cadential six-four. The chords at (b) and (c), in which the major third of the root is not present, are not augmented sixths proper, and though they may be regarded as modifications of the French form, yet it is preferable to regard them from other standpoints. Both of these chords resolve naturally upon the dominant chord, and they are available for use in both the major and the minor mode. The chord at (b), which is the enharmonic equivalent of the minor artificial tetrad derived from the mediant as a generator (§239), may be regarded as a modified diminished tetrad on L (the fifth of the root chromatically raised) in its third inversion.

The chord at (c) may be regarded as a modified primary tetrad on VII, in its third inversion, with the fifth of the root chromatically raised, and as such it will come under consideration in the succeeding section.

264. The chromatic modification next in importance to the chords of the augmented sixth, is **the augmented triad**. Reference

to this chord has already been made in § 206, and again on page 372, and further reference to it will be necessary in the succeeding chapter, as it is one of the three great chords by which enharmonic modulation is effected.

Augmented triads may be formed upon I, IV and V, in the major mode, that upon V being the most important; these are known as the superior augmented triads. They may also be formed upon certain chromatic notes, namely, -II, -III, -VI and VII; these are known as the inferior augmented triads. Furthermore, there are two extreme augmented triads, one on II and the other on oV. The complete series of augmented triads is shown in the following example:



The following example illustrates the use of the superior augmented triads:

(a) (b) (c)

#5 4 3 #5 9 8 6 8 7
4 - 2 #5 3

Ix IVx Vx

The inferior augmented triads constitute the ordinate augmented triads of the minor mode.

The minor seventh of the root is frequently added to the augmented triad on V, as at (c), and occasionally to that on I, and possibly to those on -III, IV and VII; in which case there arises

the interval of an augmented sixth (or its inversion, the diminished third); and should these chords be taken in their third inversion, they become identical with that form of the chord of the augmented sixth, to which reference was made in the preceding section.

In the minor mode, an augmented triad naturally occurs on III; this chord is generally preceded by V, and usually resolves upon VI, or possibly I.

The augmented triad has two inversions, but, apart from enharmonic modulation, they are not often employed; suffice it to say that the chromatically raised fifth, in whatever part it is placed, naturally resolves by rising a minor second. The first inversion of III_x, in the minor mode, is identical with the dominant minor sixth, as explained in the preceding chapter; this chord will be considered further in the succeeding chapter.

Augmented triads may also be formed in the major mode by *chromatically lowering the root of a minor triad*, the triads available for this modification being II₋, III₋, VI₋ and the chromatic triad L₋. The chords which thus arise, it will be seen, are identical in notation with the inferior augmented triads, (the triads of the minor mode) in resolution, however, the chromatically lowered note naturally falls a minor second.

A chord of the **augmented fifth**, distinct from the augmented triad, may be obtained by *chromatically raising the fifth of a minor triad*; but this chord is very rarely employed. The modern enharmonic scale justifies the use of four such modified minor triads, which together with two extremes, are exhibited in the following example:

Extreme | | | | | | Extreme

-III-5x VII-5x IV-5x I-5x V-5x II-5x

In actual composition, the chromatic note should be introduced as a passing note. The interval of an augmented third being foreign to the principle of chord construction, these triads, if de-

sired, may be notated as the first inversions of major triads, of which they are the enharmonic equivalents.

265. The **diminished triad**, as an independent chromatic modification, is of rare occurrence; as a diatonic triad, and as a derivative of the primary tetrad, it has already been considered, and when employed under other conditions, the chromatically changed note is regarded and treated as an auxiliary note. Even at (a), where the bass falls to the fifth of the root before proceeding to the chromatically raised root, this note — the hyper-tonic — is, in effect, a passing note:



The fifth of the root, it will be seen, is doubled in the above example; it is generally best to double the third of the root, but in this particular case the chord is treated in practically the same manner as though the root were not changed at all.

Diminished triads may be freely formed from both major and minor triads, by *chromatically raising the root of the former*, and by *chromatically lowering the fifth of the latter*, but the chords which thus arise are resolved upon the same lines as the chords of the diminished triads, which have already been considered, and further reference to their treatment, therefore, is not necessary. In like manner the root of a primary tetrad may be chromatically raised, when the chord is converted into a diminished tetrad; indeed, the inferior diminished tetrads are frequently introduced from superior primary tetrads in this manner.

A chord of the **diminished fifth**, distinct from the diminished

triad, may be obtained by *chromatically lowering the fifth of a major triad*; but this chord is very rarely employed. The modern enharmonic scale justifies the use of five such modified major triads, which, together with two extremes, are exhibited in the following example:—



In each of the above triads, it will be seen, that the interval of a diminished third occurs; in actual composition this interval would usually be inverted. To each of the above triads, moreover, if the minor seventh of the root be added, the French form of the chord of the augmented sixth arises, in its second inversion; and as such, the chord would probably be regarded and treated. Further reference will be made to this chord in the succeeding chapter, as it is available for use in connection with enharmonic modulation.

266. The diatonic **displacements** and **additions**, as explained in the preceding chapter in connection with the dominant chord, may also be employed in connection with the *primary chromatic tetrads*, and thus arises a great number of chromatic modifications, to exemplify which would not only entail innumerable examples, but would also serve but little purpose, as the general treatment of these modified chords is practically the same as that when the dominant itself is the root. One point of difference, however, may be noted, namely, that whereas the dominant discords naturally resolve upon the tonic chord, discords upon other roots, in order not to induce modulation, most frequently resolve upon the dominant chord.

267. Another chromatic modification, occasionally employed, is the chord of the diminished seventh introduced *fortuitously*, as at (a) or (b):—

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The image shows two musical examples, (a) and (b), each consisting of a grand staff (treble and bass clefs) with a key signature of one flat (B-flat). Below the staves are numerical figures and chord symbols.

Example (a) shows a sequence of three chords. The first chord has notes G4, Bb4, D5, and F5 in the treble, and C3, E2, G2, and Bb2 in the bass. The second chord has notes A4, C5, Eb5, and G5 in the treble, and D3, F2, Ab2, and C3 in the bass. The third chord has notes B4, D5, F5, and Ab5 in the treble, and E3, G2, Bb2, and D3 in the bass. Below the first chord is the figure 5 3 and the symbol xIV7^o. Below the second chord is the figure 6 #4 b and the symbol xIV7^o. Below the third chord is the figure 5 3 and the symbol xIV7^o.

Example (b) shows a sequence of three chords. The first chord has notes G4, Bb4, D5, and F5 in the treble, and C3, E2, G2, and Bb2 in the bass. The second chord has notes A4, C5, Eb5, and G5 in the treble, and D3, F2, Ab2, and C3 in the bass. The third chord has notes B4, D5, F5, and Ab5 in the treble, and E3, G2, Bb2, and D3 in the bass. Below the first chord is the figure 5 3 and the symbol xII7^o. Below the second chord is the figure 6 #4 #2 and the symbol xII7^o. Below the third chord is the figure 5 3 and the symbol xII7^o.

Though the root of the chord at (a) is $\times IV$, and the generator II, and the root of the chord at (b) is $\times II$ and the generator L, (see also § 183, (d), yet neither of these chords is regarded from the fundamental standpoint. The root throughout is I, employed as a pedal note, while the notes at (a) and (b) in the upper parts are auxiliaries, that in the treble being a diatonic turning note, and those in the alto and tenor being chromatic turning notes. This chord is sometimes termed a passing diminished tetrad.

The diminished tetrad, indeed, may be introduced into musical composition in such a variety of ways, that, unless employed judiciously, it is apt to give rise to *harmonic monotony*; the student must, therefore, exercise care and caution in the use of this chord in particular.

Minor tetrads and secondary tetrads, under certain conditions, may also be modified chromatically, but they are rarely considered as independent chords, the chromatic changes in such cases being usually regarded and treated as auxiliary notes.

268. **Appoggiaturas**, to which reference was made in § 192, are among the most popular forms of chromatic modifications. This type of ornamentation may be employed with either single or double auxiliaries. At (a) and (b) single appoggiaturas are exemplified in relation to the tonic and dominant chords respectively; at (c) and (d), double appoggiaturas are exemplified in relation to the same chords:—

The first system of musical notation for 'The Song of the Lark' is shown. It consists of two staves, treble and bass, with a grand staff bracket on the left. The key signature is one sharp (F#). The system is divided into four measures, each labeled with a letter above it: (a), (b), (c), and (d). Below the staves, the fingering for the right hand is indicated: #2 - 3, 6, #4 - 5, #4, 5, #4, 7 -, #2, 5 6, 3 -, and 3. The notes are as follows: (a) Treble: G4 (quarter), A4 (quarter), B4 (quarter); Bass: F#3 (half), G3 (half). (b) Treble: A4 (quarter), B4 (quarter), C5 (quarter); Bass: G3 (half), A3 (half). (c) Treble: B4 (quarter), C5 (quarter), D5 (quarter); Bass: A3 (half), B3 (half). (d) Treble: C5 (quarter), D5 (quarter), E5 (quarter); Bass: B3 (half), C4 (half).

The auxiliary notes in the above examples do not give rise to independent chords, they simply modify the chords in connection with which they occur. Thus the chord at (*a*) is the tonic chord with the third temporarily displaced by its lower chromatic auxiliary; that at (*b*), the dominant chord with its fifth similarly displaced; while the chords at (*c*) and (*d*) exemplify double chromatic displacements.

Chromatic appoggiaturas may be employed upon the above principle also in the minor mode, but this form of the chromatic element is far more restricted in the minor mode than it is in the major.

269. The following example illustrates the various ways in which a chord may be modified by the use of chromatic passing notes. The chord at (*a*) is the first inversion of the supertonic tetrad, which naturally resolves upon a cadential six-four; at (*b*), it is converted into the first inversion of a primary tetrad on the supertonic; at (*c*), into the first inversion of a minor tetrad on the supertonic; at (*d*), into a German sixth on the subdominant; at (*e*), into the first inversion of the diminished tetrad on the hyper-supertonic; at (*f*), into the third inversion of the French sixth on the minor submediant; at (*g*), into one of the exceptional forms of the augmented sixth on the subdominant; and at (*h*), into a modification of the diminished tetrad on the hyper-supertonic (the fifth

of the root being chromatically lowered), the enharmonic equivalent of the German sixth on the minor submediant, in its third inversion:

(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
6 5	6 5	6 5	#6 5	#6 5	6 5	#6 5	#6 5
II ₇ ¹	II ₇ ¹	II ₇ ¹	IV ₆ ^x 5	xII ₇ ⁰ ¹	-VI ₆ ^x 4	IV ₆ ^x 5 3-	xII ₇ ⁰ ¹
						500	

Each of the above chromatic modifications of II₇¹ may be introduced after the chord at (a), and may resolve upon the cadential six-four; with the exception of the chords at (g) and (h), they are also all independent chords, and have been explained in this or previous chapters. The exceptional interval of a doubly augmented fourth, between the treble and alto, at (g) and (h), arises not infrequently in connection with chromatic auxiliary notes.

Chromatic modifications, it will thus be seen, are practically unlimited, but sufficient explanation of their use has been given in this chapter to indicate the principles upon which this particular form of harmonic embellishment is introduced into music. No definite rules can be laid down with regard to their use; but a certain degree of uniformity is generally desirable in this respect. If, for example, the opening phrase of a composition is chromatic in character, it would be inartistic not to maintain this style more or less exactly throughout. On the other hand, the interest of a composition which is chiefly diatonic in character, may often be materially increased by the occasional employment of a chromatic progression. Experience, born of an acquaintance with the best works of the greatest composers, will alone prompt the student to

introduce the chromatic element into music in a manner conducive to the amplification of light and shade in tonal color.

SUMMARY

- § 255. Chromatic modifications generally.
The five principal types.
- § 256. The chord of the augmented sixth.
Its probable historic origin.
- § 257. The fundamental origin of $-VI_{6x}$.
The supertonic, its real generator.
- § 258. The nominal root of $-VI_{6x}$.
Inversions calculated from this note.
- § 259. Various chromatic resolutions of $-VI_{6x}$.
The notes of the interval $6x$ should not proceed by similar motion.
- § 260. The inversions of $-VI_{6x}$.
Care must be taken not to confuse the figurings of these chords with those of ordinary tetrads.
- § 261. Chords of the augmented sixth on notes other than $-VI$.
On $-VI$ and $-II$, the superior; on $-III$, VII and IV , the inferior.
- § 262. The use of these chords exemplified.
- § 263. Other forms (exceptional) of $-VI_{6x}$.
- § 264. The augmented triad.
On V , I and IV , the superior; on VII , $-III$, $-VI$ and $-II$, the inferior.
- § 265. The diminished triad.
Rare as a chromatic modification. The chord of the diminished fifth.
- § 266. Displacements and additions.
In connection with primary chromatic tetrads.
- § 267. The diminished tetrad.
Care must be taken to avoid harmonic monotony.
- § 268. Chromatic appoggiaturas.
Employed chiefly in connection with I and V .
- § 269. Chromatic passing-notes.
Various methods of modifying a given chord.

EXERCISES

I

1. Classify chromatic modifications.
2. Explain the presumable historic origin of the chord of the augmented sixth.
3. Explain the harmonic source of the chord of the augmented sixth, and refer to their nominal, apparent and actual roots.
4. Write and resolve the inversions of the Italian, French and German forms of the augmented sixth in the key of *A*.
5. Write the superior, inferior and extreme chords of the augmented sixth in the keys of *E* major and *A* flat major.
6. Give examples of the exceptional forms of the augmented sixth in the key of *B* flat.
7. Describe the augmented triad, and exemplify its use in the keys of *E* flat major and *F* sharp minor.
8. Explain the use of the diminished triad as a chromatic chord.
9. Briefly refer to the chromatic modifications which arise (*a*) by augmenting the fifth in the minor triad, and (*b*) by diminishing the fifth in the major triad.
10. Exemplify the use of the diminished tetrad as a fortuitous chord.
11. Give some account of the part played by appoggiaturas in connection with the chromatic element.
12. Write the first inversion of the dominant seventh in the key of *F*, and illustrate various methods of modifying it by the use of chromatic passing-notes.

II

13. Introduce and resolve the following chords. Commence with the tonic and end with the perfect cadence in each case, employing not more than four or five chords.

(a) (b) (c) (d) (e) (f) (g)

(h) (i) (j) (k) (l) (m) (n)

14. Complete the following passage by inserting the chords indicated by the symbols. Figure the bass.

(a) (b) (c) (d)

Ix xII₇₀¹ -VI_{6x} xI₇₀

(e) (f) (g) (h) (i) (j)

VII_{6x}¹₆ VI₇¹ II_{6x} L₇₀³ I₇- L₇

(k) (l) (m) (n) (o)

15. Add alto and tenor parts to the following exercise:

1 5 #4 5 5 - b6 - 5 — #6 4 6 7
3 #2 3 #2 3 #4 #4 2 — 5 3 # #

6 #5 #6 #6 #6 #7 8 - 9 b9 8 - -
#4 #4 b 5 #4 #7 - #7 6 5 -
3 #4 4 - 4-3#3

7 #6 7 5 #3 4 b6 - 7 6 7 #5 #5 - b6 #7
4 - 2 3 #4 - 2 3 #2 #4 #4



$\sharp 9$ 8 - $\sharp 9$ 7 - - - 4 3 $\flat 9$ 8 $\flat 9$ 8 $\sharp 7$ $\flat 9$
 5 - 7 - 6 5 - $\sharp 6$ $\sharp 7$ $\flat 6$ 7 $\flat 6$ 5 $\flat 6$
 4 - $\sharp 3$ - 4 - 3 - 4 $\sharp 3$ 5 4 $\sharp 3$ 4



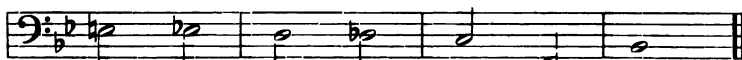
8 - $\flat 9$ $\sharp 7$ 8 -
 $\sharp 7$ - $\flat 6$ 5 - $\flat 6$ - - 5 - $\sharp 4$ 5 -
 4 - - 3 4 - - - 3 $\sharp 2$ 3 -

Add treble, alto and tenor parts to the following:

16



$\flat 6$ 5 7 $\sharp 6$ 6 4 6 - \flat $\flat 7$ 8 $\sharp 7$ 8 $\sharp 6$
 \flat 3 $\sharp 4$ 4 \flat $\flat 5$ - 6 - 5 5
 3 - 4 3



$\sharp 6$ 7 $\sharp 6$ $\sharp 6$ $\sharp 6$ 7 $\flat 6$ $\sharp 6$ $\sharp 6$ 5 7 5 $\flat 7$ 7 - 8
 4 $\sharp 5$ $\flat 4$ $\flat 5$ 4 \sharp $\flat 4$ $\flat 5$ 4 \sharp - 4 - 3 4 3 2 3

17



7 - 6 6 - $\sharp 6$ 6 - 9 8 x 5 \sharp - 6 $\sharp 6$ - 7
 $\sharp 4$ - $\sharp 4$ 6 6 $\sharp 5$ 4
 2 - 3 -

6 5 #6 6 5 7 8 - #7 8 - b7 #8 - #7 8 - #7
 4 4 3 #6 #5 6 #5 - #4 5 #6 5 6 5 - #4 5
 3 b4 - - #3 - #2 3 #4 - - 3 - #2 3

#4 #5 7 - #6 6 7 5
 3 4 #5 4 5 3
 3 - -

18

#6 4 3 b6 #4 6 6 #6 6 5 #6
 3 - 5 4 #

6 #6 8 #7 #7 #6 8 - 4 7 #6 #6
 5 6 - 5 4 3 - 3 4 - 2 -
 4 #2 #3

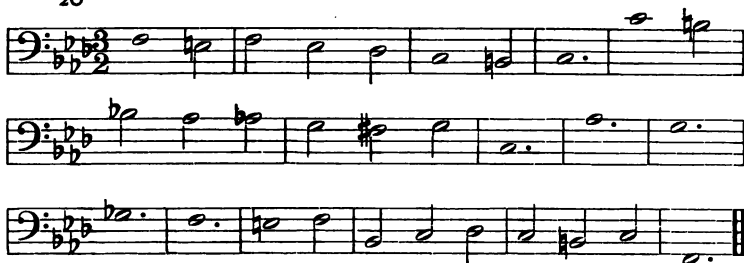
5 6 7 9 8 - 5 - 4 6 6 - 6 7 8 7 #
 3 4 4 #3 - 2 - b 4 - 4 4 b3 # -

III

Harmonize the following basses:

19

20



Harmonize the following melodies:

21



22



23





25. Compose a common metre Hymn-tune, in the key of *D* flat major, introducing the following chords:

(a) (b) (c) (d) (e) (f) (g) (h)



26. Write a musical sentence in the key of *G* sharp minor, introducing various chromatic modifications.

CHAPTER XXIII

ENHARMONIC MODULATION

270. Modulation may be effected by three distinct methods, namely, the Diatonic (or gradual) the Chromatic (or sudden) and the Enharmonic. The two former methods have been considered in Chapters VI, XI and XVIII, and further reference will be made to them at the end of the present chapter. By enharmonic modulation is understood, a change of key effected by the change of notation (without change of pitch) of one or more notes of a chord. The chief chords available for treatment of this character are:

1. **The diminished seventh**, convertible into the same chord in other keys.

2. **The augmented sixth** (German form) and **the primary tetrad**, interchangeable.

3. $\left\{ \begin{array}{l} \text{The augmented triad, and} \\ \text{The minor sixth} \end{array} \right\}$ both interchangeable and convertible into the same chords in other keys.

In addition to the above, the French form of the augmented sixth and the primary tetrad with fifth diminished are also both interchangeable, and convertible into the same chords in other keys: but this enharmonic change is of comparatively very rare occurrence. Furthermore, the interval of a diminished fifth, as it occurs in a primary tetrad, is also susceptible of enharmonic treatment.

The enharmonic change of a complete chord gives rise to enharmonic equivalence, and such a change is not regarded as enharmonic modulation.

Enharmonic modulation in relation to the chord of the diminished seventh, and in relation to the German sixth and the augmented triad, has already been partially explained in Chapters XIV and XVIII. In the present chapter the whole subject will be considered systematically; the principles alone, however, will be explained, for, indeed, the subject is practically inexhaustible.

27-. Of the various chords employed in enharmonic modulation, **the diminished tetrad** is by far the most comprehensive. Three separate and individual modulations may be effected by the use of this chord, from any given key to any and every other key, both major and minor. For, since there are but three distinct diminished tetrads in music, which, by certain enharmonic changes, occur in every key; and since each of these chords may be resolved upon V_7 , in its own key, it follows that any diminished tetrad in a given key may be resolved upon V_7 in any other key.

Thus, at (a), (b) and (c), are shown the three diminished tetrads of *C* major, each resolving upon V_7 ; at (d), (e) and (f), the same chords are enharmonically changed into the three diminished tetrads of *D* flat major, resolving upon V_7 in this key; and at (g), (h) and (i), a modulation, on similar lines, is made to the key of *B* major:

(a) $b7$ $b5$ $\sharp 6$ $\sharp 4$ $\sharp 2$ III_{70}

(b) $b7$ 6 5 I_{70}

(c) $b7$ 4 2 6 xIV_{70}

(d) $b7$ $b6$ $b4$ $b5$ xIV_{70}^{\sharp}

(e) $b7$ $b6$ $b4$ $b5$ III_{70}^{\sharp}

(f) $b7$ $b6$ $b4$ $b5$ I_{70}^{\sharp}

(g) (h) (i)

$\begin{matrix} \flat 7 & \sharp 6 & \sharp 6 & 6 \\ \flat 5 & \sharp 4 & \sharp 4 & \sharp \\ & 3 & & \end{matrix}$
 $\begin{matrix} \flat 7 & \sharp 6 & \sharp 6 & \sharp 5 \\ & \sharp 4 & \sharp 5 & \sharp \\ & 3 & & \end{matrix}$
 $\begin{matrix} \flat 7 & \sharp 6 & 7 & (\sharp 5) \\ & 5 & \sharp 5 & \sharp \\ & 3 & & \end{matrix}$

L_{70}^3
 $\times IV_{70}^3$
 III_{70}^1

Modulations may be made to every other key upon the same principles, further examples, therefore, are unnecessary.

272. Innumerable variations of the above modulations are available, of which the following, modulating to the extreme key of *F* sharp major, are among the most important.

I. By that diminished tetrad or inversion thereof in the original key which, by enharmonic change (if necessary), becomes, in the new key

(a) L_{70}^3 , resolving upon V_7

(b) III_{70}^3 , resolving upon I_{+7}

(c) $\times IV_{70}^3$, resolving upon II_{+7}

The seventh of the root, in each case falling a minor second to its generator, while the other notes of the chord remain stationary.

(a) (b) (c)

$\begin{matrix} 6 & \sharp 4 & - & (\sharp 5) \\ \flat 5 & \sharp 2 & - & \sharp \\ & & & \end{matrix}$
 $\begin{matrix} 6 & \sharp 4 & - & 7 \\ \flat 5 & \sharp 2 & - & \sharp 5 \\ \flat & & & \end{matrix}$
 $\begin{matrix} (\sharp 5) & \sharp 6 & \sharp 6 & - & \sharp 5 \\ & \flat 5 & \sharp 4 & - & \flat 7 \\ & & \sharp 2 & - & \sharp \\ & & & & \flat \end{matrix}$

$L_{70}^3 V_7$
 $III_{70}^3 I_{+7}$
 $\times IV_{70}^3 II_{+7}$

II. By that diminished tetrad or inversion thereof in the

original key which, by enharmonic change (if necessary), becomes, in the new key—

(d) $\times IV_{70}$, resolving upon a cadential six-four. This method is probably the most popular of all these modulations.

(e) $\times IV_{70}^1$, changing, by lowering the bass a semitone, into a German sixth; or, by lowering both the bass and the fifth, into a French sixth:

(d) (e)

Chord symbols for (d): $\times IV_{70}$, German sixth, French sixth.

Chord symbols for (e): German sixth, French sixth, German sixth.

III. By that diminished tetrad or inversion thereof in the original key which, by enharmonic change (if necessary), becomes, in the new key

(f) $+III_{70}$ Resolving upon a Neapolitan sixth.

(g) $+III_{70}^2$ Resolving upon II_{+7}^2 :

(f) (g)

Chord symbols for (f): $+III_{70}$, Neapolitan sixth, German sixth.

Chord symbols for (g): $+III_{70}^2$, II_{+7}^2 , German sixth.

The principle upon which each of the above modulations is effected may be employed for modulating to any and every other key. Further examples of enharmonic modulation by the use of this unique chord would serve but little purpose; sufficient has been said to indicate the general principles upon which it is employed.

A word of caution may here be given, once more, in regard to the too frequent use of the diminished tetrad, which more readily, perhaps, than any other chord in the whole realm of music, is apt to give rise to harmonic monotony.

273. Next in importance to the chord of the diminished tetrad are the chords of **the German sixth** and **the primary tetrad** which, as said above, are enharmonically interchangeable. When it is remembered that there are five chords of the German sixth (§ 261) in every major key, and ten chromatic primary tetrads besides V_7 , not to mention extreme chords, and that each of the primary tetrads may be employed as being derived from I and II as well as V in the new key, it will be seen that the possible modulations by the use of these chords are very numerous. It is manifestly impracticable to illustrate all of these modulations, and since the principles upon which they are effected are similar in all cases, it will be convenient and sufficient to exemplify, in the first instance, the superior German sixths and the primary tetrad on V, only. By means of these chords, the more distant keys may readily be connected with a given key, as shown in the following examples:

From Gn. 6 to V_7 :

(a) (b) (c) (d) (e)

Gn. 6 V_7 Gn. 6 V_7 Gn. 6 V_7 Gn. 6 V_7 Gn. 6 V_7

From primary tetrad to Gn. 6:

(f) (g) (h)

I_7 -Gn. 6 V_7 Gn. 6 II_7 Gn. 6

274. The chord of **the German sixth** may be introduced and even regarded as the first inversion of the diminished tetrad on the interdominant with the bass note chromatically lowered, and thus, on the principle explained in § 272 a modulation from any given key to any and every other key may be effected in accordance with the following formula:

By that diminished tetrad or inversion thereof in the original key which, by enharmonic change (if necessary), becomes $\times IV_7^0$ in the new key, then chromatically lowering the bass note, and resolving the chord upon a cadential six-four. See also § 272, II, (e).

The following examples illustrate this form of modulation from the key of *C* to (a) the key of *A* major, and (b) the key of *E* flat major:

(a)

$\times IV_7^0$ Gn. 6

(b)

$\times IV_7^0$ Gn. 6

In modulating to the keys of *F* major and *B* flat major on this principle, no enharmonic change will be necessary, as the diminished tetrads on the interdominants of these keys occur as chromatic chords in the key of *C* major.

It is customary in actual composition not to notate the enharmonic change, when proceeding from V_7 to Gn. 6, in which case, V_7 resolves chromatically upon the cadential six-four, the enharmonic change being understood. The following fragment of chromatic melody, for example:

might appear, at first sight, to verge on the unmusical, but in reality it is susceptible of simple harmonic treatment, as shown in the

following sequential passage, where each V_7 is resolved as $Gn. 6$ in a key one semitone lower:

6/4 7/3 #6/4 7/#5 #6/b4 b7/b5

V_7 V_7 V_7

(Gn. 6) (Gn. 6) (Gn. 6)

#6/4 7/# #6/b4 b5/3 9/b4 8/b3 4 3 2 3

V_7

(Gn. 6)

275. The enharmonic treatment of **the augmented triad** and the chord of **the minor sixth** is of a more complicated nature than that of the preceding chords, and it will be desirable to consider these chords under three distinct headings:

I. The augmented triad enharmonically convertible into the same chord in another key, chiefly employed in connecting major keys.

Like the diminished tetrad, the component notes of the augmented triad are equidistant, and thus a given chord, by enharmonic change, may belong to three different keys. V_x , for example, in the key of C , may be changed to V_x in the keys a major third above and below C , namely, E and A flat, as shown respectively at (a) and (b). I_x , in the key of C , may be taken as V_x in the key

of *F*, and may be changed into V_x in the keys of *A* and *D* flat (or *C* sharp), as shown at (c) and (d), and IV_x , in the key of *C*, may be taken as V_x in the key of *B* flat, and may be changed into V_x in the keys of *D* and *G* flat (or *F* sharp), as shown at (e) and (f).

(a) (b) (c)

V_x E^+
 V_x V_x

V_x A^{b+}
 V_x V_x

I_x A^+
 V_x V_x

(d) (e) (f)

I_x D^{b+}
 V_x V_x

IV_x D^+
 V_x V_x

IV_x G^{b+}
 V_x V_x

In order to effect a modulation to the three remaining keys, it is customary to employ either the extreme augmented triad (§ 264) II_x , which may be introduced after V , and which is generally preferred, or the inferior augmented triad, VII_x , which may be introduced after IV , and which is the enharmonic equivalent of II_x^2 . The reason for this preference is probably to be found in the fact that the root of II_x is a diatonic note, and the chord of the minor sixth on II (the enharmonic equivalent of II_x) is a chromatic chord of comparatively common occurrence, whereas, the root of VII_x is a chromatic note and the chord of the minor sixth on VII (the enharmonic equivalent of VII_x) is an extreme chromatic, of rare

occurrence, Π_x , in the key of C , may be taken as V_x in the key of G , and may be changed into V_x in the keys B (or C flat) and E flat, as shown at (g) and (h). In like manner VII_x , in the key of C , may be taken as V_x in the key of E flat, and may be changed into V_x in the keys of G and B (or C flat).

(g) (h)

IIx $B^+ V_x$ IIx $E_b^+ V_x$

By the use of the augmented triad, therefore, a modulation is practicable from any given major key to any and every other major key, certain enharmonic changes being necessary, except in three cases, namely, in proceeding to the keys of the dominant, the subdominant and the subtonic.

In four-part harmony the root (alone) of V_x is doubled, wherefore, in this case — unlike the preceding chords — when the enharmonic change occurs in one part, another part must move, usually up or down a major third, to the root of the new chord. If, however, the seventh be added to V_x , when the enharmonic change is made, one of the parts doubling the root in the first chord will naturally proceed to the seventh, and the presence of the seventh will necessitate the doubling of the third in the succeeding tonic chord.

Though customary, it is by no means necessary to employ V_x of the new key exclusively, I_x , IV_x and even II_x , may also be employed, if desired; and thus almost endless forms of modulation by means of the augmented triad are possible and available.

276. II. The chord of the minor sixth enharmonically convertible into the same chord in another key, chiefly employed in connecting minor keys.

Like the augmented triad, of which it is the enharmonic equivalent, the chord of the minor sixth by enharmonic change, may also belong to three different keys. V_{6-} , for example, in the key of *C* minor, may be changed to V_{6-} in the keys a major third above and below *C*, namely, *E* minor and *G* sharp (or *A* flat) minor, as shown respectively at (a) and (b). I_{6-} , in the key of *C* minor, may be taken as V_{6-} in the key of *F* minor, and may be changed into V_{6-} in the keys of *A* minor and *C* sharp minor, as shown at (c) and (d). II_{6-} , may be taken as V_{6-} in the key of *G* minor, and may be changed into V_{6-} in the keys of *B* minor and *D* sharp (or *E* flat) minor, as shown at (e) and (f):

The image contains two systems of musical notation, each with three examples labeled (a) through (f). Each example consists of a grand staff (treble and bass clefs) showing a chord in C minor and its enharmonic equivalents in other keys. Below each staff, the chord is identified with a label and its constituent notes.

System 1:

- (a) V_{6-} in *C* minor (notes: *E*, *G*, *B*). Below: V_{6-} *E*- V_{6-}
- (b) V_{6-} in *C* minor (notes: *E*, *G*, *B*). Below: V_{6-} *G*#- V_{6-}
- (c) I_{6-} in *C* minor (notes: *C*, *E*, *G*). Below: I_{6-} *A*- V_{6-}

System 2:

- (d) I_{6-} in *C* minor (notes: *C*, *E*, *G*). Below: I_{6-} *C*#- V_{6-}
- (e) II_{6-} in *C* minor (notes: *D*, *F*, *A*). Below: II_{6-} *B*- V_{6-}
- (f) II_{6-} in *C* minor (notes: *D*, *F*, *A*). Below: II_{6-} *D*#- V_{6-}

In order to effect a modulation to the three remaining keys, it is customary to employ IV_{6-} , and thus the same roots are employed for the chord of the minor sixth in the minor mode as are usually employed for the augmented triad in the major. IV_{6-} , in the key of *C* minor, may be taken as V_{6-} in the key of *B* flat (or *A*

sharp) minor, and may be changed into V_{6-} in D minor and F sharp minor, as shown at (g) and (h):

The musical notation consists of two systems, (g) and (h), each with a treble and bass staff. In system (g), the bass staff shows a progression from a chord with root Bb (IV₆₋) to a chord with root D (D- V₆₋). The treble staff shows a progression from a chord with root Bb to a chord with root D. In system (h), the bass staff shows a progression from a chord with root Bb (IV₆₋) to a chord with root F# (F#- V₆₋). The treble staff shows a progression from a chord with root Bb to a chord with root F#.

By the use of the chord of the minor sixth, therefore, a modulation is practicable from any given minor key to any and every other minor key, certain enharmonic changes being necessary except in three cases, namely, in proceeding to the dominant, the subdominant and the subtonic.

In four-part harmony the root (alone) of V_{6-} is doubled, wherefore, when the enharmonic change occurs in one part, another part must move to the root of the new chord. If, however, the seventh be added to V_{6-} , one of the parts will naturally proceed to this note. It is customary for the sixth to fall to the tonic, but it may remain stationary, or may even rise to the dominant; and it may, of course, fall one degree to the fifth of the dominant, before proceeding to the tonic. It is not necessary to employ V_{6-} of the new key exclusively, by employing other roots, as in the case of the augmented triad, almost endless forms of modulation by means of the chord of the minor sixth are also possible and available.

277. III. The augmented triad enharmonically convertible into a chord of the minor sixth, and vice versa, chiefly employed in connecting major and minor keys.

It will not be necessary to exemplify the enharmonic interchange of these chords, for, the examples in § 276, are, it will be seen, the enharmonic equivalents of those in § 275. Reference to

the æsthetic significance of these two chords has already been made in the introductory chapter, (p. 371), and it now only remains to illustrate their use in modulation.

The enharmonic interchange of V_x and V_{6-} is especially useful and effective in connecting keys in affinitive relationship.

Both V_x and V_{6-} may be introduced ornamentally, as in the following passage which exemplifies, with a certain peculiar effect of dubious tonality, a modulation from *C* major to *C* minor, and then back to *C* major:

C^-
 V_7
 6^-

C^+
 V_7
 5_x

278. The following formulas may assist the student in the use of these chords.

I. From major key to major key.

By that augmented triad or inversion thereof in the original key which, by enharmonic change (if necessary), becomes V_x in the new key.

II. From minor key to minor key.

By that chord of the minor sixth or inversion thereof in the original key which, by enharmonic change (if necessary), becomes V_{6-} in the new key.

III. From major key to minor key.

By that augmented triad or inversion thereof in the original key which, by enharmonic change (if necessary), becomes V_{6-} in the new key. The converse of the last formula holds good in proceeding from a minor key to a major key.

It would be altogether impracticable to attempt an exemplification of all the possible modulations by the use of the above

formulas; it will be sufficient to give one example of each, the general principles being the same in all cases. At (a), a modulation from *C* major to *F* sharp major is shown; at (b) from *C* minor to *F* sharp minor; at (c), from *C* major to *F* sharp minor; and at (d), from *C* minor to *F* sharp major:

The image contains four musical examples, each consisting of a grand staff (treble and bass clef) with piano accompaniment. Below each staff is a chord formula.

- (a) $IV_{x^2}^{F\sharp+} V_x$: Shows a modulation from C major to F# major. The first chord is a French sixth in C major (F, C, G, A), and the second is a dominant seventh in F# major (F#, C#, G#, A#).
- (b) $IV_{6-3}^{F\sharp-} V_{6-}$: Shows a modulation from C minor to F# minor. The first chord is a French sixth in C minor (F, C, G, A), and the second is a dominant seventh in F# minor (F#, C#, G#, A#).
- (c) $IV_{x^2}^{F\sharp-} V_{6-}$: Shows a modulation from C major to F# minor. The first chord is a French sixth in C major (F, C, G, A), and the second is a dominant seventh in F# minor (F#, C#, G#, A#).
- (d) $IV_{6-3}^{F\sharp+} V_x$: Shows a modulation from C minor to F# major. The first chord is a French sixth in C minor (F, C, G, A), and the second is a dominant seventh in F# major (F#, C#, G#, A#).

279. The French form of the augmented sixth and the primary tetrad with fifth diminished, though rarely employed, are also available for use in enharmonic modulation; and not only are these chords enharmonically interchangeable, but each of them is also convertible into a chord of similar nature in another key. Thus, at (a), the French sixth in the key of *C* is enharmonically changed into the same chord (second inversion) in the key of *F* sharp; at (b), it is changed into the dominant seventh with fifth diminished in the key of *D* flat; at (c), the dominant seventh with fifth diminished in the key of *C* is enharmonically changed into the same chord (second inversion) in the key of *G* flat; and at (d), it is changed into the French sixth in the key of *B*:—

(a) (b)

Fr. 6 $F\sharp_+$
Fr. 6

Fr. 6 $D\flat_+$
 V_7
50

(c) (d)

V_7 $G\flat_+$
50 V_7^{\sharp} 50

V_7 B_+
50 Fr. 6

Enharmonic modulation by means of the French sixth is rarely employed in actual composition; indeed, textbooks on Harmony as a rule fail to mention the possibility of such modulation,¹ while some authors even go so far as to say that the German is the only form of the augmented sixth available for use in this connection.

280. Another form of modulation, briefly referred to in § 93 (Part I), is the enharmonic change of a diminished fifth to an augmented fourth, available in connection with primary tetrads, in extreme relationship with one another, as shown at (a) and (b):

(a) (b)

C_+ $G\flat_+$ C_+ $F\sharp_+$
 V_7 V_7 V_7 V_7

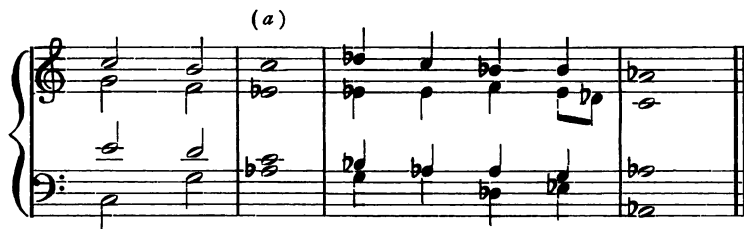
A mysterious effect, arising from *dubious tonality*, but not without artistic value. more especially in instrumental music, may be obtained by the use of the above enharmonic change, as exemplified in the following sequence, where the chords, until a final resolution is introduced, impress the ear as being dominant sevenths alternating with German sixths on the minor supertonic:



281. Although the student must be familiar with the principles of enharmonic modulation, as explained above, yet it may here be said that, in ordinary cases, the diatonic is preferable to either the chromatic or the enharmonic methods of effecting a change of tonality. The true value of enharmonic modulation is to be found in the fact that it is available for use at all, so that it may be employed, if desired, for some particular effect. Chromatic modulation is generally most effective in connection with transient changes of tonality. The most natural method of proceeding to a new key is by diatonic modulation; and since simplicity, as a general rule, is more desirable than complexity, the student is advised, especially at examinations, unless the chromatic or the enharmonic is required, to employ the diatonic method. He will do well to remember that any two keys whatsoever may be connected by the use of, at the most, five common chords in root position, and it is excellent practice to write modulations on these simple lines, and afterwards to ornament the progressions by the employment of suspensions and auxiliary notes, after the manner of florid counterpoint. The following passage, for example, illustrates a modulation from *C* minor to the extreme key *F* sharp minor, the symbolic analysis indicating the harmonic significance

nection with common chords to which the attention of the student may be particularly directed, namely, that every common chord, in root position, whenever it may occur, possesses *a certain element of tonic character*; and this element is more or less pronounced according to the prominence attached to the chord. In the deceptive cadence, for example, the function of the submediant chord may be changed to that of the tonic in the key of the relative minor, a change of tonality being mentally effected while the chord is sustained; and the succeeding chords will then determine the new key.

In the following passage, -VI+ (originally borrowed from the affirmative minor key) is introduced at (a), this chord then becomes a new tonic, and the succeeding chords determine the key of *A* flat:



The above example is an instance of **transition** (§ 200), that is to say, a change of tonality is effected without the use of the establishing dominant chord. Another instance of transition is illustrated in the following example. At (b) the function of VI is changed to that of I in the key of *A* minor, and then the function of V in this key is changed to that of I in the key of *E* major, the tonality of which is determined by the succeeding chords:



Another form of transition, frequently employed in proceeding to keys of second relationship, is exemplified at (c) and (d), where the new tonic is more gradually established, by *the reiteration of an intervening note common to the two keys*:



Transition to keys a major or minor second above the tonic may be effected by introducing them in a similar manner to that at (c) and (d), after a chord of the subdominant; and to keys a major or minor second below the tonic, after a chord of the dominant. The extreme keys of *F* sharp and *G* flat are rarely, if ever, approached by transition, but should it be desired to proceed to them by this method, they may be introduced by compound transition, as at (e) and (f) respectively:



283. In writing continuous passages of modulation it is desirable to construct them upon the basis of a *regular musical sentence*. It may be taken for granted that the student who has reached this stage in harmony is familiar with the general principles of form in composition; and it will be sufficient, therefore, to outline one plan only upon which such passages may be written, which may be taken as a model for the construction of other plans. The binary, or 16-bar sentence is perhaps the most convenient form for such passages, and it is advisable to work exercises of this character in three distinct stages, namely:

(1) a blank rhythm, indicating the phrases, and the positions of the cadences, etc.;

(2) a figured bass (or, the same harmonized) in accordance with the required modulations;

(3) the exercise completed, by the use of suspensions and auxiliary notes, etc., in uniform style throughout.

As the importance of this type of exercise cannot be over-estimated, a solution to the following typical form of examination question may be of some assistance to the student.

Write a continuous passage of modulation, commencing in the key of C major, passing through the keys of B, E flat, A flat, G, B minor, C minor, F minor, and D flat, and ending in the original tonic key.

Employing the simple form of the long metre hymn-tune as a basis for rhythm, the modulations may be arranged, as follows:

The musical notation is presented in two staves. The first staff contains five measures of music, each marked with a key signature below: C+, B+, Eb+, Ab+, and G+. The second staff contains five more measures, marked with B-, C-, F-, Db+, and C+. Brackets above and below the staves indicate the phrasing and measure divisions.

The close relationship which exists between the keys of *E* flat and *A* flat, and between the keys of *C* minor and *F* minor, and *F* minor and *D* flat, admit of passing modulations, and one measure only is sufficient in each case; but in connecting the other keys, at least two measures are desirable. The outline of chords may then be written, as follows:

(a) (b) (c) (d)

8 7 8 #6 7 #5 #6 b7 (b5) b7 (b5) b6 6 7
 5 - 5 4 (#5) # x #5 b5 b5 4 #
 3 4 3 # E^{b+} A^{b+} G⁺
 I V⁷ I III- IV- I² V⁷ I V⁵ V⁷ I V⁷ I N⁶ I² V⁷
 I- 5x V

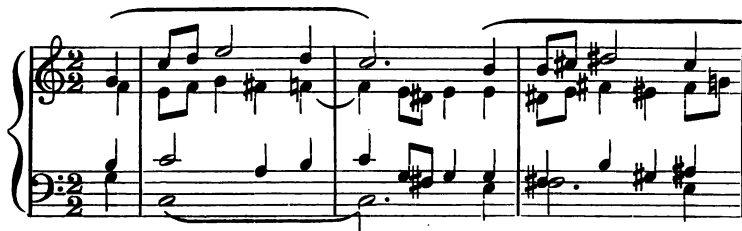
(e) (f) (g) (h) (i)

6 7 #5 #6 b6 7 b #4 6 b7 (b5) b7 #6 #6 7
 4 (#5) b5 4 3 b b5 b5 - 4 3
 B- # C- F- D^{b+} C⁺
 I VI I² V⁷ I xIV⁷⁰ I² V⁷ I V⁷ (III¹) V⁷ I V⁷ Gn.6 I² V⁷ I

The methods of modulation adopted in the above example are as follows:

- (a) Diatonic, III- = IV-
- (b) Enharmonic, V_{5x}¹ = V_{5x}
- (c) Diatonic (natural), I₊ = V₊
- (d) Diatonic, I₊¹ = N₆
- (e) Diatonic, I₊ = VI₊
- (f) Enharmonic, by xIV₇₀¹ of new key
- (g) Chromatic (natural), by L₇₀² of new key
- (h) Diatonic (natural), I- = III-
- (i) Enharmonic, V₇ = Gn.₆

It now remains to rewrite the above passage, and convert it into an interesting musical sentence; for this purpose the rhythm should be modified, and the chords treated ornamentally, after the following manner:—



SUMMARY

- § 270. The chief chords employed in enharmonic modulation.
 1. The diminished tetrad. 2. The German sixth and the primary tetrad. 3. (a), The augmented triad; (b), the minor sixth.
- § 271. The three diminished tetrads.
 Each resolvable upon any V_7 .
- § 272. Other resolutions of the diminished tetrad.
 Into $\times IV_7^o$, of the new key, the most popular.
- § 273. The German sixth and the primary tetrad.
 Especially valuable in modulating to distant keys.
- § 274. The German sixth only.
 It may be treated and regarded as $\times IV_7^o$ with bass chromatically lowered.
- § 275. The augmented triad, changing into another augmented triad.
- § 276. The minor sixth, changing into another minor sixth.
- § 277. The augmented triad and the minor sixth, interchangeable.
- § 278. Three formulas, applying to the use of the augmented triad and the minor sixth.
- § 279. The French sixth and the dominant seventh with fifth diminished.
 Though enharmonically interchangeable yet rarely employed.
- § 280. The primary tetrad.
 Enharmonically interchangeable when the roots move $\sharp o$.
- § 281. Simplicity in modulation generally desirable.
 V_7 , the establishing chord, but any chord derived from V available.
- § 282. Transition.
 Every common chord possesses a tonic character.
- § 283. Continuous passages of modulation.
 1. A blank rhythm; 2. a figured bass; 3. the finished exercise.

EXERCISES

I

1. Enumerate the chords by which enharmonic modulation is effected.

2. Mention seven different uses of the diminished tetrad in connection with enharmonic modulation. Which of the seven is probably the most popular?

3. Give examples of modulation effected by the enharmonic interchange of the German sixth and a primary tetrad, and show that keys in *extreme* relationship may be connected, in two entirely different ways, by the interchange of $-VI_{6x}$ and II_{+7} .

4. Exemplify the use of the augmented triad and its enharmonic equivalent, the dominant minor sixth, in relation to changes of tonality.

5. Explain the difference in harmonic effect between the intervals of an augmented fifth and a minor sixth, and show that a certain dubious or equivocal effect of tonality may be obtained in modulating from a major key to its affinitive minor, and vice versa.

6. Is any form of the chord of the augmented sixth, other than the German, susceptible of enharmonic treatment?

7. Define transition, and give various examples of its use.

8. Show that the interval of a diminished fifth, as part of one dominant seventh, may be enharmonically changed into an augmented fourth, as part of another dominant seventh, thus allowing of keys in extreme relationship with one another to be conveniently connected.

II

9. Modulate, by the enharmonic change of diminished tetrads, in three entirely different ways, from *F* major to *E* major.

10. Modulate, by enharmonically introducing the diminished tetrad on the interdominant (xIV_{70}) of the new key, from *G* major to (a) *E* major, (b) *B* flat major, (c) *F* sharp major, (d) *A* flat major, (e) *C* sharp minor, and (f) *E* flat minor.

11. Modulate, by the enharmonic interchange of primary tetrads and German sixths, from *A* major to (a) *F* major, (b) *B* flat major, (c) *E* flat major, in two ways, (d) *A* flat major, and (e) *D* flat major.

12. Modulate, by the enharmonic change of augmented triads, from *E* flat major to (a) *G* major and (b) *B* major; to (c) *C* major

and (*d*) *E* major; to (*e*) *D* major and (*f*) *F* sharp major; and to (*g*) *E* major and (*h*) *A* major.

13. Modulate, by the enharmonic change of dominant minor sixths, from *F* sharp minor to (*a*) *B* flat minor and (*b*) *D* minor; to (*c*) *E* flat minor and (*d*) *G* minor; to (*e*) *F* minor and (*f*) *A* minor; and to (*g*) *A* flat minor and (*h*) *C* minor.

14. Modulate, by the enharmonic interchange of dominant minor sixths and augmented triads, from *B* minor to (*a*) *B* major and (*b*) *E* flat major; from *E* minor to (*c*) *A* major and (*d*) *D* flat major; from *F* major to (*e*) *F* sharp minor and (*f*) *B* flat minor; and from *B* flat major to (*g*) *E* minor and *G* sharp minor.

15. Compose a regular binary sentence, in $\frac{6}{8}$ time, exemplifying various methods of modulating enharmonically; begin and end in the key of *E* major, and pass through the keys of *F* sharp minor, *G* major, *B* major, *D* minor, *A* flat major and *D* flat major.

16. Compose a regular ternary sentence, in $\frac{3}{4}$ time, exemplifying different kinds of enharmonic modulation; begin and end in the key of *F* minor, and pass through the keys of *E* flat major, *D* minor, *B* flat minor, *G* major, *C* sharp minor and *G* sharp minor.

Additional practice on this subject may be obtained by working exercises Nos. 11 to 16, in Chapter XVIII (Part II), and connecting the various keys by enharmonic modulation.

CHAPTER XXIV

CONTRAPUNTAL HARMONY

284. Counterpoint, or polyphony, is the art of combining two or more melodies, or rather, melodious passages; a melody (properly so called) is divisible into at least two phrases, but it is the exception rather than the rule, for contrapuntal themes to be so divided. In Harmony, or monophony, one melody alone is considered, which, though usually assigned to the treble voice, may appear in any of the other voices. Counterpoint is of two kinds, strict and free; in the former, triads and their first inversions alone are employed, and the melodies are exclusively diatonic in character; in the latter, the use of chords is not restricted, and thus Harmony and Counterpoint are united into one and the same art.

Contrapuntal harmony may, therefore, be defined as music in which each voice is imbued with melodic interest. Counterpoint leads naturally to Imitation, Canon and Fugue, but in the present chapter Imitation alone, and this only in a limited degree, will enter into consideration. From the historical standpoint, contrapuntal harmony may be divided into three periods: (I) the early, or triad period, exemplified in the works of Palestrina and the madrigalian composers, of the sixteenth and seventeenth centuries; (II) the late, or tetrad period, exemplified in the works of Bach and his contemporaries, of the eighteenth century; and (III) the modern, or free period, exemplified in the works of the Romantic composers, of the nineteenth and twentieth centuries.

The study of harmony does not prompt the student to write melodious inner parts, nor does the study of counterpoint prompt him to write other than the simplest harmonic progressions; by uniting the two arts, however, interest from both the harmonic and the melodic standpoint may be both obtained and maintained.

285. It may be taken for granted that the student, who has reached the present stage in harmony, has some knowledge of strict counterpoint, but he is not to suppose that the individual five

species (or orders) are about to engage his attention once more, it is the *purpose* underlying counterpoint rather than its actual rigid style, which is now about to be considered. Harmony, as the basis of composition, may be said to have had its birth in counterpoint, and the general laws of the latter are equally applicable to the former. The objection to consecutive fifths, for example, may probably be traced to that sense of indefinite tonality which arises when a series of triads is formed upon the successive notes of the major diatonic scale. For, as every common chord possesses a tonic character, more or less pronounced according to its duration, so such a series of triads (in the first species of counterpoint) would give rise to the suggestion of a succession of unrelated keys, as illustrated in the following example:



The triads at (b) and (c) are, respectively, the tonic chords of the keys of *D* minor and *E* minor, and although both of these keys are in first relationship with the key of *C* major, yet they are *foreign* to one another. In like manner, the triads at (c) and (d), and those at (d) and (e) are also the tonic triads of foreign keys; and the omission of the third in each triad, leaving the bare fifth, in no way ameliorates the progressions. Furthermore, in this connection, it may be noted that in each of these progressions the false relation of the tritone is also present; thus, it will be seen that consecutive fifths, false relation of the tritone, and indefinite tonality, are all closely allied with one another.

The objection to consecutive fifths under one set of conditions would naturally lead to their prohibition generally; and this law,

together with other laws associated with counterpoint, became the fundamental laws of harmony. Harmony, therefore, with the exception of those melodic considerations to which reference was made above, now includes practically everything that is understood by the term counterpoint. Hence, at this stage in harmony it becomes necessary for the student to cultivate a mellifluous style in relation to all the voices.

286. As it would be impracticable to illustrate all the various uses of counterpoint in relation to harmony in an exhaustive manner, it may be sufficient, from an academic standpoint, to exemplify the principal styles of harmonizing a simple melody, a careful analysis and comparison of which should be both interesting and instructive to the student. These styles may be summarized as follows:

1. **The early contrapuntal.**
2. **The late contrapuntal.**
3. **The modern diatonic.**
4. **The modern chromatic.**
5. **The motival.**
6. **The canonical.**
7. **The instrumental.**

A suitable melody for the exemplification of these various styles of harmony may be formed from the major diatonic scale, ascending and descending, as follows:



The harmonization of scales, under the name of the "Rule of the Octave," was formerly regarded as an important feature in the study of harmony. The major scale, both forms of the minor, and the chromatic scale, were all employed, and might be assigned to any voice. Since the advent of the textbook with specific exercises, the rule of the octave has fallen into disuse; these

mechanical melodies, however, afford excellent practice, and naturally pave the way to the harmonization of melodies of a more artistic character.

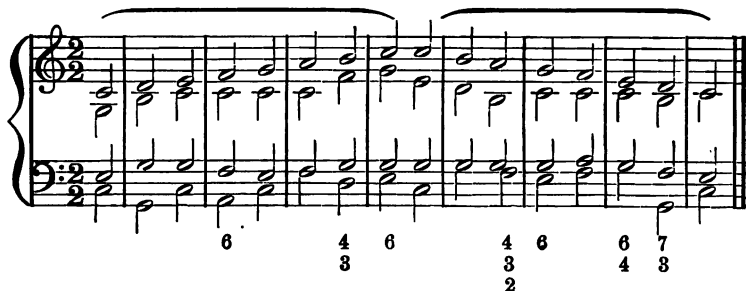
287. The early contrapuntal style. Although the masters of the sixteenth and seventeenth centuries occasionally employed the second inversion of concords, and even the dominant seventh and its inversions in actual composition, yet, by the contrapuntal style of this period is understood, so far as chords are concerned, the use of the harmonic material of strict counterpoint only, namely, the major and minor triads with their first inversions, the first inversion of diminished triads, and possibly the first inversion of the augmented triad on the mediant of the minor mode. (See §250). Interest may be imparted to the harmonic progressions by the use of suspensions, the 9 8 and 4 3 being the most preferable, and auxiliary notes, generally restricted to passing, turning and changing notes only. The diatonic element should be employed exclusively, all chromatic progressions, melodic as well as harmonic, being foreign to this particular style, even though they may occasionally be found in the compositions of this period. The following example illustrates the early contrapuntal, or Palestrina style, as it is sometimes called:

The musical score is written in 2/2 time and consists of two systems. The first system contains two measures. The first measure has a figured bass of 4 3 8 b7, and the second measure has a figured bass of 5 #6 5 6 7 6. The second system contains four measures. The first measure has a figured bass of 6 5 5 #6, the second of 8 #7 6 5 6, the third of 6 7 9 6 4, and the fourth of 3. The notation includes treble and bass staves with various note values and accidentals.

288. **The late contrapuntal style.** During the eighteenth century, tetrads, both natural and artificial, were definitely established, and their use has remained practically the same to the present day. It is a question, however, whether the minor and diminished tetrads were regarded as derivatives of pentads, or as independent chords; notwithstanding that modern German authorities regard them from the latter standpoint, it would almost seem that the masters of the eighteenth century looked upon them as derivatives. Suspensions and auxiliary notes were employed more freely than in the preceding century, while chromatic progressions both melodic and harmonic, were by no means uncommon. Admirable specimens of this style are to be found in the works of J. S. Bach, and the student would be well repaid for a careful analysis of the chorales in such a work, for instance, as the "St. Matthew Passion." The following example illustrates the late contrapuntal, or the Bach-chorale style, as it is sometimes called:

The first staff of music is in G major (one sharp) and 2/2 time. It consists of four measures. Below the staff is the figured bass notation: 6 - 6 4 6 #6 5 6 4 6 8 7. The second staff also consists of four measures, showing a more complex melodic and harmonic progression. Below the staff is the figured bass notation: - 6 b7 9 8 7 - 4 3 9 8 - 7 6 6 5 -.

289. **The modern diatonic style.** With the Romantic composers of the nineteenth century, counterpoint, as compared with harmony, plays a secondary part. Though Mendelssohn and Schumann both produced majestic contrapuntal compositions, yet they, with Beethoven and other contemporaries, are remembered for the inherent beauty of their harmonic progressions rather than for their skill as contrapuntists. Under the modern diatonic style are included all compositions written upon a basis of plain and simple harmony, such as popular songs and pianoforte pieces, and the great mass of sacred music, comprising hymn-tunes, anthems and services, etc. The chords employed are practically the same as those employed in the late contrapuntal style, but their treatment is less ornate; simplicity may be said to be the chief object in this particular style; suspensions and auxiliary notes are, comparatively, of rare occurrence; each chord stands more or less alone, lacking that interweaving effect which is a notable feature of the Bach chorale and in a less degree of the Palestrina style. The following example illustrates the modern diatonic style; the chords here employed may be regarded as the most natural exemplification of the Rule of the Octave:



290. **The modern chromatic style.** The last of the three great schools of composition was inaugurated by Wagner. In the works of this great master and his successors the highest ideals of harmony and counterpoint are united; the latter by the use of the Leit-

motive, a melody or even a fragment of melody assignable to any voice or instrument, and the former, by means of greater freedom in the matter of chromatic progressions, chiefly due to the use of accented auxiliary notes. The following example illustrates the modern chromatic style; it will be seen that the chromatic element is introduced in relation to every chord except alone the first and last:

Two systems of musical notation in 2/2 time, illustrating the modern chromatic style. Each system consists of a grand staff with treble and bass clefs. The first system has four measures, and the second system has five measures. Below each measure, numerical figures are provided, likely representing figured bass or chord symbols. The figures include various accidentals and numbers, such as b6, 6, b7, #7, 6, 6, 6, b6, 6, #, 6, -, 4, #4, #5, 4, b5, 4, 5, #, 4, 3, 6, 4, #6, 7, #5, -, #7, 7, 5, #6, 6, 5, 7, 6, 8, b9, 8, 7, 4, 2, #4, 3, 4, #3, 6, -, 3, b5, b, #, 4, -, 3, -.

291. **The motival style.** By motive (or figure) is understood a fragment of melody comprising perhaps not more than three or four notes, even possibly only two. Under the motival style, however, is also included what is termed tonal-movement, that is to say, the maintaining of quarter-note or eighth-note movement, for example, throughout a sentence. This movement differs from the second and third species of counterpoint in that it is not confined to any one voice; in fact, it should be distributed as evenly as possible between all the voices. There is practically no restriction

as to chords, but uniformity of style is necessary; if, for example, the opening figure is of a diatonic character, then the chromatic element should only be employed with discretion; and although, of course, the melodic character of the initial motive should be preserved, yet, in order to avoid monotony, contrast to a certain extent is permissible and even desirable. The following example illustrates the motival style; the motive here, three notes in falling conjunct movement, it will be seen, is introduced on the weak beats of every measure, and sometimes on the strong beats:

The image displays three systems of musical notation, each consisting of a grand staff (treble and bass clefs) with a 2/2 time signature. The notation illustrates a contrapuntal style where a specific motive (three notes in falling conjunct movement) is introduced on the weak beats of every measure, and sometimes on the strong beats.

System 1: The first system shows the initial introduction of the motive. The bass line features a descending sequence of notes (G, F, E) on weak beats, while the treble line provides harmonic support. Fingering numbers 7, 2, 3, 7, and 6 are indicated below the bass line.

System 2: The second system continues the development of the motive. The bass line shows a more complex rhythmic pattern with the motive appearing on both strong and weak beats. Fingering numbers 6, 6, #6, 6, and #5 are indicated below the bass line.

System 3: The third system further explores the motive's placement. The bass line shows the motive appearing on strong beats. Fingering numbers 6, b5, 6, 7, 2, and 3 are indicated below the bass line.

292. **The canonical style.** In order to avoid complexity in this connection, the points of imitation will be considered in relation to two voices only. Reference has already been made to three-part harmony in the Introduction to Part II, and this subject will be considered more fully in Chapter XXVI; suffice it therefore to say that this particular style resembles three-part counterpoint, except that there is no restriction in the matter of harmonic progressions. Though termed canonical, the contrapuntal parts are rarely written in strict canon for more than a few measures. A point of imitation may be of an independent character, or, as is frequently the case, it may be founded upon the principal theme, as in the example below, where the device of imitation by diminution is introduced. The choral preludes for the organ by J. S. Bach are exquisite specimens of this type of composition, and the analysis of them is of great value. The following example illustrates the canonical style; the point of imitation is obtained from the ascending tetrachord, and the canon (2 in 1, at the lower seventh) is maintained till the fourth measure:

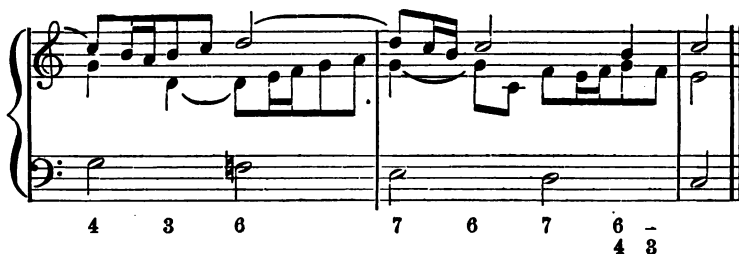
The musical score is written for two voices (treble and bass clef) in 2/2 time. It consists of two systems of four measures each. The first system shows a point of imitation in the second measure. The second system continues the canon. Fingering numbers (1-5) are written below the notes in the bass line of each measure.

First system:

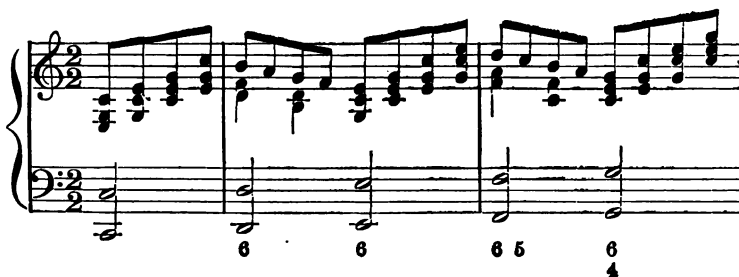
- Measure 1: Treble: G4, A4, B4, C5; Bass: G2, B1, D2, F2. Fingering: 6, 9, 8, 6.
- Measure 2: Treble: A4, B4, C5, D5; Bass: A1, C2, E2, G2. Fingering: 6, 9, 8, 6.
- Measure 3: Treble: B4, C5, D5, E5; Bass: B1, D2, F2, A2. Fingering: 6, 9, 8, 6.
- Measure 4: Treble: C5, D5, E5, F5; Bass: C2, E2, G2, B2. Fingering: 6, 9, 8, 6.

Second system:

- Measure 5: Treble: D5, E5, F5, G5; Bass: D2, F2, A2, C3. Fingering: 6, 9, 8, 6.
- Measure 6: Treble: E5, F5, G5, A5; Bass: E2, G2, B2, D3. Fingering: 6, 9, 8, 6.
- Measure 7: Treble: F5, G5, A5, B5; Bass: F2, A2, C3, E3. Fingering: 6, 9, 8, 6.
- Measure 8: Treble: G5, A5, B5, C6; Bass: G2, B2, D3, F3. Fingering: 6, 9, 8, 6.



293. **The instrumental style.** Harmony for instruments as distinguished from voices will be considered in Chapter XXVII; in the present connection it will be employed from the ordinary four-part harmony standpoint, and as such, it may be regarded as being intended for performance by a string quartet. With a free accompaniment, it is often effective for the vocal forces to sing in octaves, or, as it is generally called, in unison. The chorale "Nun danket alle Gott," in Mendelssohn's Lobesang, is a fine example of a composition for voices in unison, with an independent accompaniment for the stringed instruments of the orchestra; and such an accompaniment, notwithstanding its contrapuntal character, is effective also for the organ or pianoforte. The following example illustrates the instrumental style; the voice parts are in unison, and the general style of the accompaniment is obtained from the figure employed in the opening measures, the eighth-note movement being maintained throughout:





294. Double counterpoint is the art of combining two melodies that are invertible, that is to say, either of them is a correct bass to the other. The most usual interval of inversion is that of the octave (or fifteenth); counterpoint of this character is of common occurrence in the works of classical composers. An example will be found in Beethoven's sonata in F, Op. 10, No. 2, third movement, measures 88-92, 93-96, 97-100, et seq. Double counterpoint may be written so that the melodies are invertible at other intervals, the tenth and twelfth being next in importance, but these are rarely to be found in any but compositions of a fugal character.

Another form of double counterpoint is that of combining two melodies of such a character that thirds may be added to one or other or both of them, thus increasing the number of parts; this type of counterpoint is called "**Added thirds.**"

These forms of double counterpoint are written upon the same principles as simple counterpoint, but with the following exceptions.

In double counterpoint at the octave, fifths must be treated in the same manner as fourths.

In double counterpoint at the tenth there must be no similar motion.

In double counterpoint at the twelfth, sixths must be treated in the same manner as sevenths.

In added thirds the melodies must be in double counterpoint at the octave; there must be no similar motion; syncopations may be employed, but not suspensions; and disjunct movement is not desirable.

In no case may the interval of inversion be exceeded between the melodies.

Triple and quadruple counterpoints, the art of combining respectively three and four melodies, are also written upon the principle that each of the parts may be available for use in the bass. These devices are necessary in fugues when there are three or four distinct subjects, otherwise, at the present day, they are regarded practically in the light of academic exercises only, for, they play little or no part in the *materia musica* of the modern composer.

SUMMARY

§ 284. Monophony and polyphony.

All voices in contrapuntal harmony possess melodic interest.

§ 285. Harmony, the offspring of counterpoint.

Consecutive fifths closely allied with the false relation of the tritone and indefinite tonality.

§ 286. The seven styles of harmonizing a melody.

The Rule of the octave.

§ 287. The early contrapuntal style.

Triads, with suspensions and auxiliary notes, as employed in strict counterpoint.

§ 288. The late contrapuntal style.

Triads, etc., as above, with tetrads, both primary and secondary, and pentads and their derivatives.

§ 289. The modern diatonic style.

Simple chords, as employed in hymn-tunes, and congregational music generally.

§ 290. The modern chromatic style.

Chromatic concords and discords, with both accented and unaccented chromatic auxiliary notes.

§ 291. The motival style.

Simple chords, as a rule, with a motive or figure introduced and maintained throughout.

§ 292. The canonical style.

Points of imitation introduced in the contrapuntal manner, but not necessarily in strict canon form.

§ 293. The instrumental style.

A free accompaniment consisting chiefly of arpeggios, auxiliary notes and chord repetition.

§ 294. Double counterpoint, etc.

That at the octave, of common occurrence in classical compositions.

EXERCISES

I

1. Name the periods into which contrapuntal harmony may be divided.
2. State the reason why consecutives fifths are prohibited.
3. Enumerate the various styles in which melodies generally may be harmonized.
4. Define "Rule of the Octave," and give examples of its use.
5. Briefly describe the principles of harmony upon which the compositions of Palestrina are based.
6. Mention the characteristic features of the Bach chorale.
7. Define "Motive." What is understood by motival development?
8. Explain the meaning of "Point of Imitation." Name the composer, and refer to his works, to whom we are indebted for the perfection of the imitative style of composition.
9. Compare simple and double counterpoint. Mention any instances of double counterpoint in the sonatas of Beethoven.
10. In what respects do double counterpoints at the octave, tenth and twelfth, differ from simple counterpoint?

II

Exercises on harmonizing melodies, exemplifying the use of the seven styles as illustrated in the present chapter, will be found at the end of the Chapter XXV; and further melodies will be found in the additional exercises at the end of the book. The following exercises may be reserved, if desired, until after the succeeding chapters have been mastered; indeed, the student must possess some knowledge of counterpoint, canon and fugue, in order to work them successfully.

11. To the following chorale, add two melodies, one above and one below, in the (free) florid style.

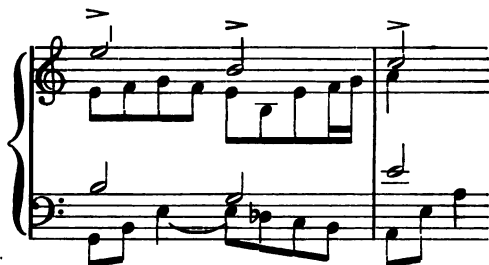


12. Transpose the above theme into the key of *D*, place it in the treble, and add three melodies below, each in florid style.

13. Transpose the above theme into the key of *A*, place it in the bass, and add four melodies above, each in florid style.

14. Continue the harmonization of the following chorales, "London New," "Wareham" and "Hereford," maintaining the style of the given parts, more or less exactly, throughout.





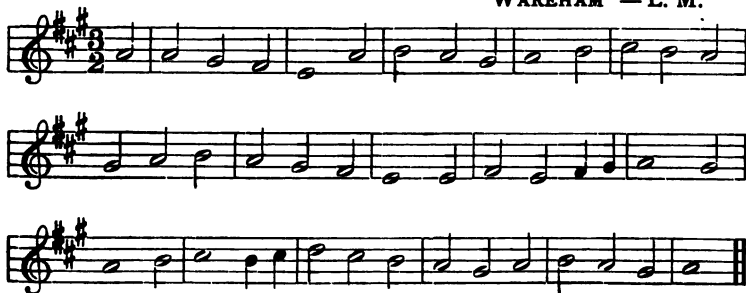
"LONDON NEW."—C. M.



15



"WAREHAM"—L. M.



16.



"HEREFORD." — C. M.



17. Continue the following passage, in two-part canon form (2 in 1, at the lower octave), for about sixteen measures; write in the style of the Bach Invention, introduce a modulation to the key of the dominant, and conclude with a short coda in four-part harmony.





18. Continue the following passage, in two-part canon form (2 in 1, at the upper octave), for about thirty-two measures; introduce the given figure in the keys of the dominant and submediant; rests may be employed, but the eighth-note movement should be maintained throughout.



19. Add three upper parts to the following unfigured bass in the strict florid style; the opening phrase (from the tune, "St. Ann,") may be introduced in the tenor, alto and treble, successively, at the points marked T, A and S, after the manner of a fugal exposition, but the four-part counterpoint should be maintained throughout.





CHAPTER XXV

BASSES AND MELODIES

295. The true end and aim of Harmony being composition, and the initial stage in composition being the invention of melody, it follows that the real object in view before the student is the harmonization of melodies. The study of melody belongs to the realm of Form in music, of which subject, it may be taken for granted that the student possesses some knowledge; a brief reference only, sufficient to assist him in working exercises, will therefore be made to the same in the present chapter.

A melody, when harmonized, is called a musical sentence. Of the regular musical sentence there are three varieties in ordinary use, namely:

I The normal sentence	{	binary form, with two phrases (eight measures). ternary form, with three phrases (twelve measures).
------------------------------	---	--

II The binary sentence, with two periods (sixteen measures)

III The ternary sentence, with three periods (twenty-four measures).

The phrase (four measures), which should invariably conclude with a cadence, is sometimes divisible into strains (two measures), and the strain sometimes into motives (one measure). Irregular sentences are obtained by (1) extending a phrase, (2) contracting a phrase, (3) overlapping phrases, (4) employing an intrada, and (5) adding a coda.

The student must be prepared to write examples of each of the above sentences, to introduce specified chords, progressions and modulations, at the same time maintaining the style of a given motive or strain. Definite originality is neither expected nor desired; for harmony is but the grammar of music, and the avoidance of grammatical errors is, therefore, the principal consideration. If the student possesses the gift of originality, he will find it of

(i) (j) (k) (l)

7 6 6 7 6 7 4 7 4

b5 4 # 3 b

2 -

The student should have no difficulty in analyzing the above progressions, all of which have been explained in previous chapters.

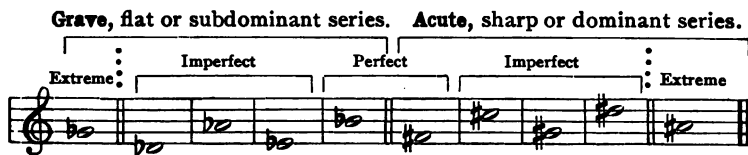
Other cadences may be modified on similar lines; it is the perfect cadence, however, to which particular attention should be directed, especially when it occurs in the course of a sentence, for when employed too frequently in root position, it interrupts continuity of style. The perfect cadence, moreover, may be employed with *strong* or *weak* harmonic effect, the former when both chords are in root position with the melody ending on the tonic, and the latter when one or both chords are inverted or when the melody ends on the mediant or dominant. The weak effect of this cadence plays an important part in connection with the less important modulations; by its use a definite termination in the new key may be avoided, and thus, continuity of tonal effect is obtained.

It must be admitted that melodies, or so-called melodies, in which no provision is made for cadences, exist and occasionally appear on examination papers, but when no cadences are given, no cadences will be expected; all such passages may be regarded simply as melodic meandering, and often without rhyme or reason.

297. The next consideration is that of **modulation** which, of course, is naturally closely allied with the cadences. As explained in § 105, modulation may be either *transient* or *permanent*, the former occurring in the course of a phrase, and the latter, to which alone reference will now be made, at the end. The cadence in the case of permanent modulations is almost invariably the perfect, or

a modification of the same, but the deceptive cadence *may* be employed, and in the minor mode only, an imperfect cadence is permissible. Modulations can be determined by the character of the melody alone. An accidental may suggest a change of key, or such an accidental may be simply a chromatic note; on the other hand, modulation to nearly related keys may often be effected in a purely diatonic passage.

There are ten possible accidentals available for use in relation to a key, each of which may be **diatonic** or of modulating character, or **chromatic** or non-modulating character. These accidentals in relation to the key of *C* major are as follows:



The above, as chromatic accidentals, will be considered in the succeeding section. As diatonic accidentals, the flats naturally suggest IV in the major mode, and III, IV or VI in the minor; the sharps naturally suggest L in the major mode, and L, II or +VI in the minor. The context will usually determine the key, but in the case of ambiguity the student must decide the matter according to his judgment. The extreme chromatics, $\flat V$ and $\sharp VI$, are rarely employed except as auxiliary notes in relation to the subdominant and dominant chords of a key, respectively.

298. A chromatic accidental naturally suggests a chromatic chord, but no definite rules can be laid down as to what chord in particular. The following table furnishes the chords most frequently employed in the harmonization of chromatic notes; the choice of chord may generally be determined by the progression into which it is introduced.

Technical name	Key of C	Character	Triads	Tetrads, etc.
VII	B \flat	* Per.	-III+, V-, VII+, VII-	^(a) <u>I7-</u> , ^(b) <u>III7o</u> , xI7o, VII6x.
xVI	A \sharp	Ext.	<u>IIx</u> , xIV+.	<u>xVI7o</u> .
-VI	A \flat	Imp.	-II+, ^(d) <u>IV-</u> , -VI+.	IIo7, ^(e) <u>L7o</u> , -VI6x.
xV	G \sharp	Imp.	^(f) <u>Ix</u> , ^(g) <u>III+</u> .	III+7, xV7o, VII6x.
oV	G \flat	Ext.	oV+.	<u>V17o</u> .
xIV	F \sharp	Per.	II+, L+, L-.	⁽ⁱ⁾ <u>II+7</u> , ^(j) <u>xIV7o</u> , xII7o, - ^(k) <u>VI6x</u> .
-III	E \flat	Imp.	I-, -III+, -VI+, V6-	IV7-, ^(l) <u>xIV7o</u> , - ^(m) <u>VI6x</u> .
xII	D \sharp	Imp.	⁽ⁿ⁾ <u>Vx</u> , L+.	L+7, xII7o, ^(o) <u>IV6x</u> .
-II	D \flat	Imp.	-II+, VII-, ^(p) <u>N6</u> .	-III+7-, ^(q) <u>III7o</u> , -II6x.
xI	C \sharp	Imp.	^(r) <u>IVx</u> , VI+.	VI+7, ^(s) <u>xI7o</u> , -III6x.

* 'Per.' = Perfect chromatic; 'Imp.' = Imperfect chromatic; 'Ext.' = Extreme chromatic.

The chords in the above table, though intended for melodies, are also applicable, with few exceptions, to unfigured basses. The table is by no means complete, but it is sufficient for ordinary purposes. The chords underlined, generally the most popular, are illustrated in the following example.

(a) (b) (c) (d) (e) (f) (g) (h) (i)

(j) (k) (l) (m) (n) (o) (p) (q) (r) (s)

b7 b7 #6 b b7 #5 # b7 7
 b5 5 b5 #

#6 #6 b7 #6 #5 #6 b6 b7 #5 #6
 b5 b5 b5 5 b b5 b5 b5

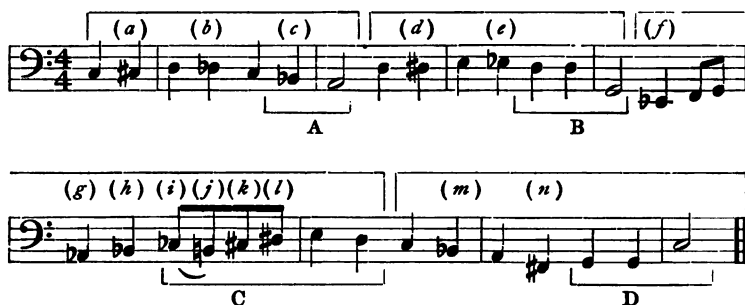
The student would do well to commit the above example to memory, and to complete the same by adding thereto the other chords given in the above table.

The table is applicable to the minor mode, but, of course, only in respect to those chords the notes of which occur in the harmonic form of the minor scale.

299. The harmonization of the following unfigured bass will exemplify the use of the above table.

The diatonic notes, in general, may be treated according to the table on page 119 (Part I); with regard to the accidentals, it is necessary to determine their character, whether diatonic or chro-

matic. The phrases, and the position of each of the cadences, are shown in the following example. At A, the cadence may be an inverted perfect in *F* major, or a modified perfect in *A* minor, or, as shown below, an imperfect in *D* minor; at B there is a modulation to the key of the dominant; at C, a modulation to the key of *E* major; and at D, a perfect cadence, of course, in the key of the tonic.



The accidentals may be treated as follows:

- | | | | | |
|-----|------|------------|-------------------|----------------------------------|
| (a) | xI, | chromatic, | C ₊ , | xI ₇₀ , |
| (b) | -II, | " | C ₊ , | -II _{6x} , |
| (c) | -VI, | diatonic, | D ₋ , | -VI _{6x} , |
| (d) | xII, | chromatic, | C ₊ , | xII ₇₀ , |
| (e) | -VI, | " | G ₊ , | -VI _{6x} , |
| (f) | I, | diatonic, | E _{b+} , | I ₊ , |
| (g) | { | IV, | " | E _{b+} , |
| | { | I, | " | IV ₋ , |
| (h) | L, | " | A _{b-} , | I ₋ , |
| (i) | I, | " | C _{b+} , | V ₁ , |
| (j) | V, | " | E ₊ , | V ₊ , |
| (k) | VI, | " | E ₊ | |
| (l) | L, | " | E ₊ , | V ₇ , |
| (m) | VII, | chromatic, | C ₊ , | III ₇₀ ² , |
| (n) | xIV, | " | C ₊ , | II ₇ ¹ . |

And the passage may now be harmonized after the following manner:—

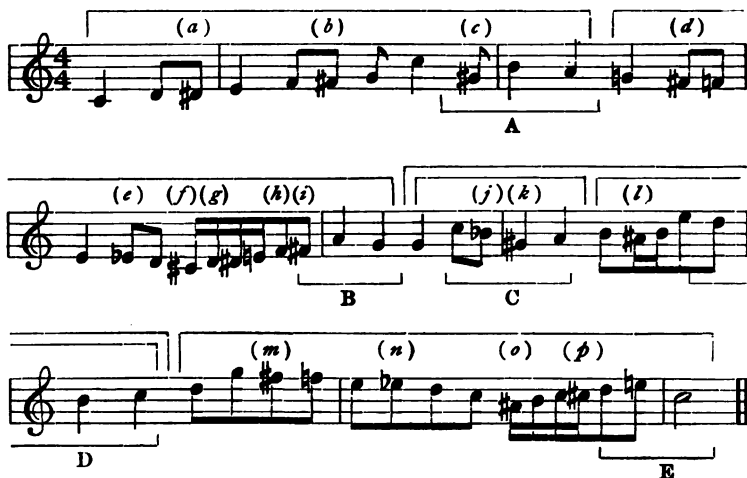
[illegible]

At (*f*), a transition is made into the key of *E* flat major; at (*i*) and (*j*), an enharmonic change is made from the chord of *C* flat major to that of *B* major; at (*m*) the progression may be regarded as a transient modulation to the key of *F*. The chord at (*o*) is a chromatic modification of the diminished tetrad on the hyper-supertonic; the *D* in the bass at (*p*), is a passing-note connecting the third and fourth strains; the false relation between the tenor and bass at (*q*) is not objectionable, see rule IX (1), page 185.

300. The harmonization of the following melody will further illustrate the use of the above table:—



The diatonic notes, in general, may be treated according to the table on page 121 (Part 1); the accidentals, as said above, must be treated according to their diatonic or chromatic character. The phrases, and the position of each of the cadences, are shown in the following example. At A, the cadence may be perfect in *A* minor, or, as shown below, a modification of the subdominant cadence; at B, there is a modulation to the key of the dominant; the third phrase is divisible into two sequential strains, with a modified perfect cadence in the key of *F* at C, and a similar cadence in the key of *A* minor at D; and at E, a varied form of the perfect cadence in the key of the tonic.



The accidentals may be treated as follows:

(a) xII, chromatic passing-note, I+,

- (b) xIV, chromatic passing-note, I₊,
 (c). xV, " I_x,
 (d) xIV, " passing-note, I₊,
 (e) -VI, " in G₊ -VI_{6x},
 (f) xIV, " appoggiatura in G₊, I²,
 (g) xV, " passing-note in G₊,
 (h) VII, " " "
 (i) L, diatonic in G₊, V₇,
 (j) IV, " in F₊, V₇,
 (k) xII, chromatic in F₊, I₊,
 (l) xI, " turning-note in A₋, V₊,
 (m) xIV, " in C₊, II₊₇,
 (n) -III, " passing-note,
 (o) xVI, " appoggiatura in C₊,
 (p) xI, " passing-note.

And the passage may now be harmonized after the following manner:—

Figured bass notation below the second system:

b7 #7 8 9 9 - 8 - 6 - #4 5 6 - 5

b #6 - #4 5 4 - 3 - b5 #2 3 6 5

3 #3 3 #3

Figured Bass notation below the staff:

#4	5	6	-	#6	#6	#4	6	5	-	#6	-	#7	#7
2	3	4	-	4	5	b		#2	3	4	4	5	6
		3	2									2	3

The movement by an augmented second in the bass at (q) is justified by the sequence.

Melodies may be harmonized, of course, in innumerable different ways. The melody above, and the preceding unfigured bass, have been chosen simply in the interests of the student, in order to assist him in this most important branch of harmony; and, in working his own exercises, he is strongly advised to follow the plan of procedure as here adopted.

301. Although the composition and construction of melodies is comprised in the study of Form in music, yet such questions as the following occasionally occur on examination papers in Harmony, and the student, of course, must be prepared to answer them.

1. Complete a melody of which a strain or phrase is given.
2. Clothe a given blank rhythm with melody.
3. Convert a simple theme into an interesting melody.

In the following question the above points are united, and the solution of the same may assist the student in working exercises of this character.

Compose a musical sentence in the key of C minor, the melody to be an elaboration of the theme:—

in accordance with the blank rhythm:—



and founded on the motive:—



introducing contrapuntal devices in all the parts.

With the harmonic basis of the theme, as follows:—



The given motive may be employed as points of imitation in various voices, thus:—



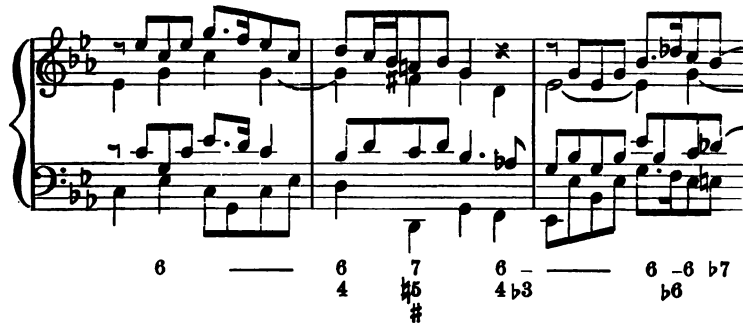
A melody in accordance with the given blank rhythm and founded on the above harmonic basis, may be written on the following lines:—



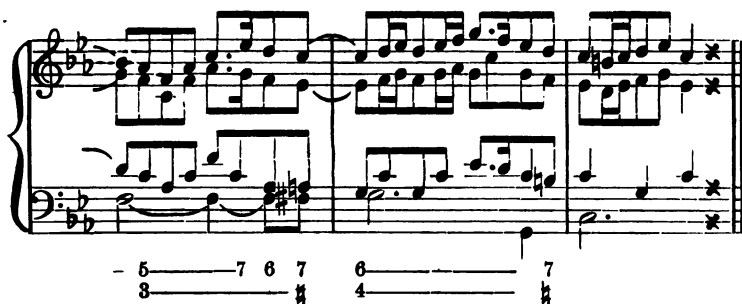
And the addition of the other parts, completing the musical sentence, may be effected in the following manner:—



6 7 - 5 6 7 6 5
6 4 3 4



6 6 7 6 - 6 b7
4 4 # 4 b3 b6



To exercises of this character, the student may be required to add a **Coda**. The simplest form of coda is the plagal cadence, as employed at the end of hymn-tunes, and such a cadence may conveniently be converted into a cadential passage, after the manner suggested by the following figured basses. At (a) is shown the bass of the plagal cadence in the key of C, preceded by the tonic, representing the final chord of an exercise; at (b), (c), (d), (e) and (f), the cadence is gradually extended and developed into finally a period of eight measures:—

(a) (b) (c)

8 ♭ 7 6
5 —
3 —

(d) (e)

4 6 #6 4 4 6 6 — 6 #4 6 ♭ 7 #6 7 #6
2 2 5
♭

(f)

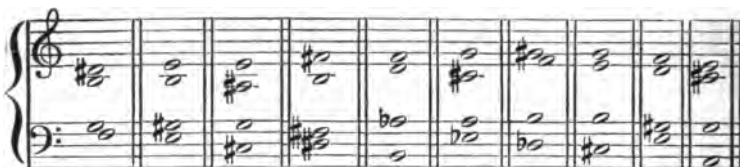
rall.

4 6 #6 #6 5 ♭ 7 4 6 #6 6 — 8 ♭ 7 6 ♭ 6 5
2 ♭ 5 4 3
♭ ♭ 5 ♭ 4 3
3

302. Another question bearing on this subject is that of analyzing chords and writing passages introducing the same. As such a passage may be a hymn-tune, the student must be familiar with the forms of the most frequently employed metres, namely, the Short (S.M.), the Common (C.M.) and the Long (L.M.). The chords in such a question are often of exceptional character, such as diatonic or chromatic modifications, and even fortuitous chords. Discords, of course, must be resolved in the usual manner, but no definite rules can be laid down as to introducing the chords; conjunct movement, when practicable, is generally desirable, and a thorough knowledge of harmonic progressions is necessary; success in this type of exercise can best be obtained by experience, and experience, of course, by practice. The solution of a typical question may assist the student in working exercises of this character.

Write a hymn-tune strictly in the key of C, introducing the following chords in the order and form as given. Analyze the chords:—

(a) (b) (c) (d) (e) (f) (g) (h) (i) (j)



The analysis of the chords, all of which have been considered in the present volume, is as follows.

(a) V_7^3 _{bx} Third inversion of dominant seventh with fifth augmented.

(b) III_+ Major triad on mediant.

(c) xVI_7^0 ¹ Diminished seventh on chromatically raised submediant, generator (xIV) chromatically raised subdominant; an extreme artificial tetrad.

(d) L_+^1 Major triad on leading-note.

(e) L_{70} Diminished seventh on leading-note, generator dominant.

(f) $-III_{6x}$ Augmented sixth, French form, on minor mediant.

(g) $-II_{6x}$ Augmented sixth, enharmonic modification of the German form, on minor supertonic.

(h) xI_7 Minor seventh on the hyper-tonic, generator submediant.

(i) III_{+9} Primary minor ninth on mediant.

(j) VI_{+7} Primary seventh on submediant.

Chromatic discords, as a general rule, occur upon unaccented beats. The chord at (i), being a pentad, the treble note may be treated as a suspension or an accented auxiliary note, and may, therefore, fall upon a strong beat; but the other chords, including those at (b) and (d) which are concords, will be preferable upon weak beats, as shown in the following solution:—

The musical score consists of two systems of chords. The first system contains five chords labeled (a) through (e). The second system contains five chords labeled (f) through (j). The notation is in 4/2 time, with treble and bass staves. Chords are indicated by notes on the staff and figured bass notation below. Chords (a), (b), (d), and (e) are concords, while (c), (f), (g), (h), and (i) are chromatic discords. Chord (j) is a primary seventh.

The above example calls for but little comment. The tonality of *C* major is maintained throughout; being well defined in the fore-phrase, it justifies the extended chromatic progressions of the

after-phrase. The restless form of the imperfect cadence is employed at the end of the first strain, and the somewhat rare super-tonic cadence at the end of the third. The notation of the chord at (g) is analogous to that employed for the notable chord of the augmented sixth in the *Andante con moto* (measure 6), Sonata (Appassionata), Op. 57, Beethoven.

303. With the present chapter, the subject of Harmony from the four-part vocal standpoint, is concluded. No attempt has been made to treat this subject in a manner different from that which obtains generally in the works of the great composers; the chief object in view throughout has been to assist the student as much as possible, in fact, to teach him what to do, instead of working on the principle of trying to teach him what *not* to do. A brief reference may here be made to certain departures from the laws of strict part-writing; such departures are sometimes called "licences," a term not altogether satisfactory, for, a license to one should be a license to another and to everybody, in which case it would cease to be a license.

These "departures" may be considered in connection with the "ten commandments" of Harmony, as given in the Introduction to Part II.

I. There is no exception to the rule relating to consecutive octaves; as previously stated, they strengthen melody but weaken harmony. If the tenors were to sing in octaves with the trebles, and the altos in octaves with the basses, the effect might be excellent, but it would not be four-part harmony, it would simply be a choral duet.

II. Consecutive fifths occur in the works of all good composers, but they occur very rarely. The rule relating to them is very simple; if they produce a good effect there is and can be no objection to them. The difficulty, from the student's standpoint, is to know when the effect is good, but like other matters appertaining to harmony, a mature judgment alone can decide the question. It may be said that consecutive fifths rarely occur in the vocal works of the best composers, and no rules can be given with regard to their use in instrumental works. When in doubt, avoid them. (See §285).

III. The bad effect of hidden consecutives is materially lessened when the second chord occurs on an unaccented beat. They should be absolutely avoided in proceeding to a secondary triad, with disjunct movement in the treble. Care must be taken to avoid objectionable hidden consecutives between the alto and treble, as well as between bass and treble; there seems to be little or no objection to them when they occur between other parts.

IV. Considerable liberty is taken with the leading-note, by modern composers, when writing in the major mode, but the treatment of this note in the minor mode is generally in accordance with the accepted rules.

V. Augmented intervals are employed with very much greater freedom than formerly, not only in instrumental but also in vocal compositions, more particularly, the augmented second of the minor mode, both ascending and descending, and the augmented fourth between IV and L in both modes.

VI. The third of the common chord is not infrequently omitted by composers, when an effect such as doubt or mystery is desired. The third in V_7 and other fundamental discords may be more freely omitted, as the interval of a third — the basis of all harmony — appears between the fifth and seventh. The third, of course, may be displaced, either temporarily or absolutely, but a displacement is not an omission.

VII. Crossing the parts, more especially the alto and tenor, is a common practice with composers when writing contrapuntal harmony; the alto rarely crosses the treble, in order not to obscure the melody; and the tenor should not cross the bass, unless the tenor, at the same time, be a correct bass to the upper parts.

VIII. Overlapping the parts depends entirely upon harmonic circumstances. If the overlapping interval be consonant, there is but little objection to the effect; but, in all such cases, the question of disjunct movement arises, the effect of which must be determined by the preceding or succeeding progressions.

IX. False relation is very common in the instrumental works of modern composers, and much more frequent in vocal works than

formerly. Mature judgment, again, is necessary to determine the effect of false relation, and the student is advised to avoid such progressions, except under the conditions mentioned on page 185.

X. Modern composers exercise considerable latitude in the matter of resolving discords; it has become an unwritten law that the seventh in fundamental discords may freely rise one degree; but the most important innovation with regard to the treatment of the seventh is to be seen in the following departure from the laws of the older authorities, namely, that the seventh may move *disjunctly* whenever stationary resolution is possible.

In conclusion, one word of advice may be offered to the student. Adhere to the generally accepted laws, for, the rules of theory are simply deductions from the practice of the greatest exponents of the art. It has been well said that "he only knows when to break a rule, who knows how to keep the rule."

SUMMARY

- § 295. The end and aim of Harmony.
The normal, binary and ternary musical sentences; the period, phrase, strain and motive.
- § 296. The position and character of the cadences.
Modifications of cadences; strong and weak cadential effects.
- § 297. Modulations.
Diatonic and chromatic accidentals; ten possible, all told.
- § 298. Table of chords for harmonizing chromatic notes.
This table should be committed to memory.
- § 299. A chromatic unfigured bass.
- § 300. A chromatic melody.
- § 301. A musical sentence.
- § 302. The analysis and introduction of chords.
- § 303. Departures from strict four-part writing.
Considered in connection with the "ten commandments" of Harmony, as given in the Introduction to Part II.

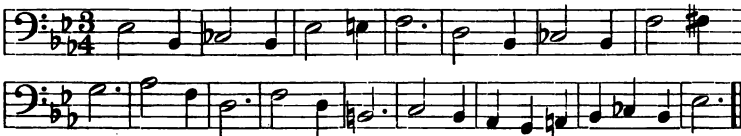
EXERCISES

1. Name and briefly describe the most frequently employed forms of the regular musical sentence.
2. Explain the methods by which irregularity is introduced into musical sentences.
3. Compare time and rhythm.
4. Write the plagal cadence in the keys of *C* major and *C* minor, and then write various modifications of the same, both diatonic and chromatic.
5. Explain the meaning of strong and weak harmonic and melodic effects, as applicable to cadences.
6. Classify accidentals in relation to (*a*) the major mode, and (*b*) the minor mode; and exemplify them in the keys of *E* flat major and *F* sharp minor respectively.
7. Give one or two chords suitable for, and suggested by, each of the chromatic notes.
8. Explain the difference between an accidental and an essential, and give examples of both, in the keys of *E* major and *A* flat major.
9. Write, employing a figured bass only, three codas, (*a*) four measures, (*b*) eight measures, and (*c*) twelve measures, each in the key of *A* major; and then transcribe them to the key of *A* minor.
10. Mention any important departures from the generally accepted laws of part-writing.

II

Harmonize the following basses; each bass may be treated in two or three different ways:—

II



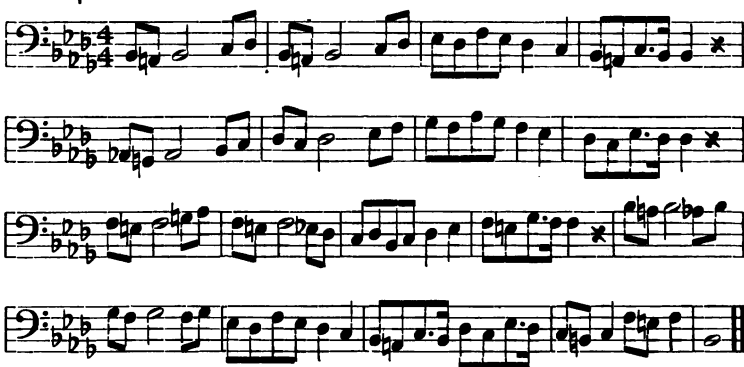
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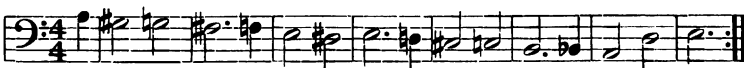
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14



15. Harmonize the following ground bass four times, twice in the minor mode and twice in the major mode; conclude with a coda constructed upon dominant and tonic pedals:—



16. Harmonize the following ground bass in a variety of styles, after the manner of a Passacaglia:—



Harmonize the following melodies:—

17



18



19



20

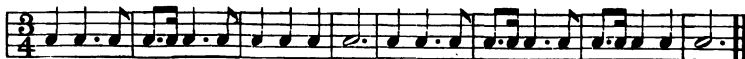




Continue the following strains, converting them into regular binary sentences; introduce modulations to nearly related keys; then harmonize the melodies for (a) three voices, or (b) four voices:—



25. Compose a Minuet, twenty-four measures in length, constructing the first sentence upon the following blank rhythm; the second sentence should be an episode in the key of the dominant, and the third, a repetition of the first:—



29

"EIN FESTE BURG"



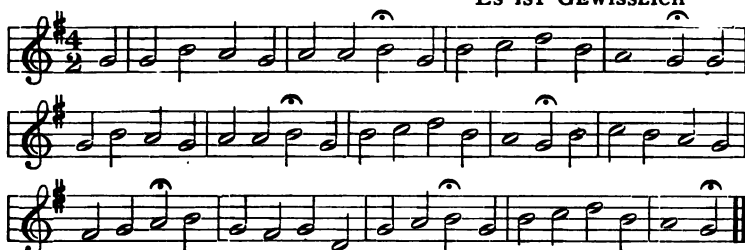
30

"ALLEIN GOTT"



31

"ES IST GEWISSLICH"



32

"O MERSCHT"



33

"WACHET AUF"



34

"WIR NUR DEN LIEBEN"



35

"UNSER VATER"



CHAPTER XXVI

FIVE-PART HARMONY

304. The number of parts in which harmony may be written is indefinite. Besides that for four voices, which is the most universally employed, and which, moreover, may be said to be the mental basis of all composition, there are two-part, three-part, five-, six-, seven- and eight-part harmony, all of which will be considered in the present chapter. Special reference, however, will be made to five-part writing, upon the principles of which, harmony for six or more voices is chiefly based. Harmony for nine or more voices is very exceptional, and in any case, a knowledge of eight-part writing is sufficient for all practical purposes.

Two-part harmony, to which only a brief reference will be made, is also of rare occurrence, that is to say, pure two-part harmony. Just as a song is a composition for a solo voice with instrumental accompaniment, so also two-part harmony, as in the case of a vocal duet, requires an instrumental accompaniment, in order to complete the harmonic effect. Even the expression "two-part harmony," in a sense is a misnomer, for, harmony treats of the form and use of *chords*, and a chord consists of at least three notes, wherefore, two-part writing, from the harmonic standpoint, must necessarily be incomplete.

The art of writing two-parts only belongs to the realm of counterpoint, and up to about the year 1850 it embraced but little more than a knowledge of the subject of intervals alone; it is possible, therefore, to write a composition for two voices without any knowledge of harmony proper at all. To-day, however, two-part writing is generally regarded as being the extreme parts (treble and bass) of four-part harmony, the strictest laws of part-writing being applicable to the same. Reference has already been made (§ 303) to a form of two-part harmony, in which all four voices (S.A.T.B.) are engaged; and mention may be made of the two-

part song, usually intended for children; otherwise two-part vocal music, as said above, is rarely employed. In instrumental music, simple canons and even fugues are occasionally written in two-parts, while the Inventions of Bach may be mentioned as masterly specimens of two-part writing. In the case of music for the piano, however, two-part harmony, by the use of arpeggios, may be treated and regarded as skeleton four-part harmony, but this is neither the purpose nor the significance of pure two-part writing, which belongs chiefly if not exclusively to the academic side of the art.

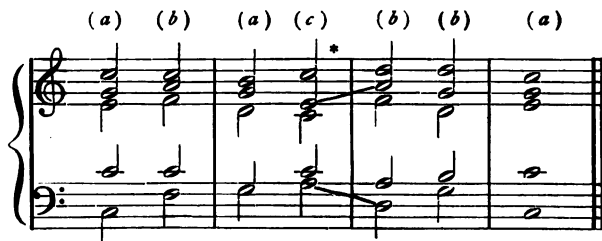
305. **Three-part harmony**, on the other hand, reference to which has already been made in the Introduction to Part II, plays an important part in musical composition. This style of writing may be regarded as being, theoretically, four-part harmony, with one part, usually the tenor, omitted. Triads, in root position, should be complete if possible; the fifth, however *may* be omitted, but not the third, except in the final tonic chord when the melody ends on I preceded by II, in which case it is usual for all parts to end on the tonic. In the first inversion, incompleteness is permissible only in order to obtain melodic interest in the upper parts. Second inversions must necessarily be complete. In tetrads, it is generally best to omit the fifth of the root; in root position the third *may* be omitted, and in the second inversion, the root itself may be omitted (as already explained in Chapter X), the chord thus becoming L¹. In pentads, the third and fifth are omitted, but these chords are rarely employed in three-part harmony; in their derivatives, the artificial tetrads, it is best to omit the third — the fifth of the generator. Suspensions, auxiliary notes and chromatic chords, generally, are treated on practically the same lines as in four-part writing; in the case of the augmented sixth, however, the Italian form of the chord is preferable to the other forms. Three-part harmony may be written for any three voices, such as S.A.B., S.A.T., A.T.B., S.S.A., T.T.B., S.S.S., etc., but the lowest voice, without exception, must be a correct bass to the upper voices. The following example illustrates three-part harmony for S.S.A.:—



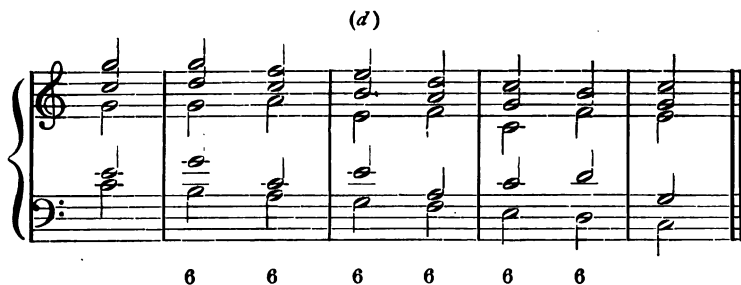
306. **Five-part harmony** is materially richer in effect than four-part, the additional voice enabling the composer to employ many chords in their complete form which in four-part writing must necessarily be incomplete. The rules of four-part harmony generally hold good for five-part; the extreme voices, however, must be arranged so that there may be sufficient play for the inner voices, wherefore it is advisable, as a rule, to keep the highest voice on or above the middle line of the treble stave. In other respects, five-part harmony may be regarded and treated as being four-part, with the addition of one inner part, usually a second treble or an extra tenor. In the important matter of doubling, considerable latitude is permitted, except in regard to the leading-note, to the rules applicable to which little or no relaxation is allowed.

In triads, the root may be trebled, as at (a), or, according to the progression, the root and either the third or the fifth doubled, as at (b). In the major mode, the third *may* be trebled in VI before V; and it *should* be trebled in VI after V, as at (c); in the minor mode, the third in VI *must* be trebled both before and after V.

There is no objection to the consecutive fifths by contrary motion, nor to the overlapping of the parts at * :—



A succession of chords of the sixth, with the bass moving conjunctly, often gives rise to difficulty in the matter of avoiding consecutives; in such a passage it is necessary to let one of the parts move with considerable disjunct movement, as shown at (d)



In the chord of the six-four, either the bass may be trebled, or the bass and either the sixth or fourth doubled. It is often preferable to double the fourth when this note is heard in the preceding chord, as at (e); and to double the sixth when it is not heard, as at (f):—



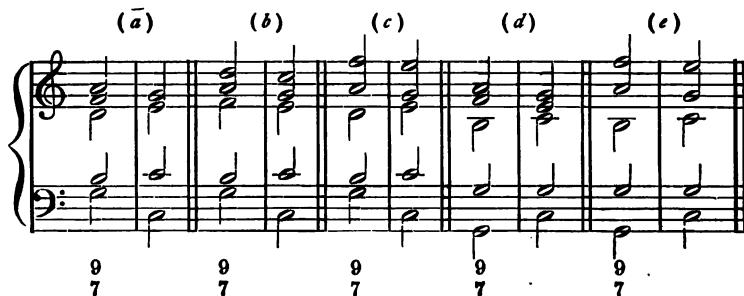
307. In the **dominant seventh** the root or fifth may be doubled, the former, as shown at (a), being preferable, as a rule. In II_7 , it is generally best to double the root, as at (b), the third or fifth may also be doubled in the major mode, and the third in the minor, but the fifth, being a diminished interval, must not be doubled. In the primary chromatic tetrad II_{+7} , the root, as at (c), the fifth and even the seventh may be doubled (see § 231), but not the third. The artificial tetrads will be considered in § 309. In tetradic sequences, unlike four-part writing, each chord may appear in its complete form. In the chord of the added sixth, which may

here be mentioned, it is generally best to double the bass as at (d), but any other note of the chord may, if desired, be doubled. The following passage illustrates the use of the above mentioned tetrads:—

The first musical example consists of two systems of staves. The first system has three measures labeled (b), (a), and (c). The second system has three measures labeled (b), (a), and (d). Each measure contains a grand staff with treble and bass clefs. Below the bass staff of each measure is a figured bass notation. The figures for the first system are: (b) 7 7, (a) 6 5, (c) 6 4 2 6. The figures for the second system are: (b) 7 7, (a) 6 4 7 3, (d) 6 5.

In the second inversion of primary tetrads, the third of the bass — the seventh of the root — may possibly be doubled, but this doubling of a dissonance is not recommended in five-part harmony, any more than in four-part.

308. **Pentads**, by their very nature, are especially adapted to five-part harmony; comprising, as they do, five distinct notes, a richness of tonal effect is obtainable, as shown at (a), (b) and (c), which is evidently impracticable in four-part harmony. The fifth of the pentad, however, if desired, may be omitted, and then the root must be doubled, as shown at (d) and (e):—



The rules in regard to the treatment of the ninth, as given in Chapter XIII, should be observed generally, whatever number of parts may be engaged.

The four inversions of V_{9+} , exemplified at (f), (g), (h) and (i), though of rare occurrence, are all available for use; but, in the fourth inversion (i), the bass should be treated as a suspension. The second inversion (g), it will be noted, may now be employed, whereas in four-part writing it was impracticable, or, at the most, available only in a modified form; the bass of this chord should, of course rise, and the third of the bass may also rise, as in the analogous case of V_7^2 :—

Figure 2: Musical notation for five-part harmony examples (f) through (i). Each example shows a grand staff with a treble and bass clef. Below each example is a figured bass line: (f) 7 6 5, (g) 6 5 4 3, (h) 6 4 3 2, (i) 7 6 4 2.

The above examples may all be transcribed to the key of C minor, thus exemplifying the use of V_{9-} . Other chords of the ninth are employed on similar lines.

309. In the artificial tetrads, the only note that can be satisfactorily doubled, as a general rule, in five-part harmony, is the

third of the nominal root — the fifth of the generator — as shown in the use of L_7 at (a). In the first inversion, however, although the bass may be doubled as at (b), yet it is permissible and effective to double the third of the bass — the seventh of the generator — as at (c), (on the principle that the third may be doubled in L^1 which is also a derivative of V) one third rising and the other falling a second in resolution. The second inversion is exemplified at (d). In the third inversion it is customary, at least in the case of the minor tetrad (the leading-seventh), to treat the bass-note as a suspension, as at (e):—

(a) (b) (c) (d) (e)

7
6
5 6
6 5 6
4 6
3 6
6 6 -
4 -
2 -

The above examples may all be transcribed into the key of C minor, thus exemplifying the use of L_{70} .

In the chord $\times IV_{70}$, being a primary chromatic discord derived from II, the fifth of the root — the seventh of the generator — may be doubled, if preferred, instead of the third, as at (f):—

(f)

6 # b7 #6 7
4 3

When an enharmonic change occurs in connection with a diminished tetrad, it is often necessary to rewrite the chord, on

account of the change of position necessitated by doubling a different note in the new chord; in actual composition, however, it is customary to write the chord once only, and as it occurs in the new key rather than the old.

310. In addition to the suspensions, simple and compound, as explained in Chapters XV and XVI, **quadruple suspensions** are available for use in five-part harmony, as exemplified at (a), (b) and (c):—

(a) (b) (c)

9	9	8	9	8	4	7	8
7	7	5	6	5	3	7	6
	6	3	4	3		5	3
	4		2			4	

Reference to a note being heard in one part which is under suspension in another, neither of them occurring in the bass, has already been made, but in five-part writing this device often becomes a necessity; such a note, however, must appear an octave or more below the suspended note, and both of these notes must be approached by contrary motion, as shown at (d) and (e):—

(d) (e)

9	6	7	6	7	-
4		4	-	6	5
				2	3

Auxiliary notes, generally, are treated in the same manner as in four-part harmony.

In diatonic modifications it is generally best to double the root of the chord, as shown in the dominant second at (*f*), the dominant fourth at (*g*), and the dominant sixth at (*h*):—

The musical notation shows three examples of chords in a grand staff (treble and bass clefs). Above the staff are labels (f), (g), and (h). Below the staff are figured bass notations: 7 2, 7 4, and 7 6. In each example, the root note is doubled in both the treble and bass staves. Example (f) shows a dominant second chord, (g) shows a dominant fourth chord, and (h) shows a dominant sixth chord.

311. No definite rules can be laid down with regard to the doubling of notes in **chromatic chords**, but, as a general rule, diatonic notes should be doubled in preference to chromatic, unless the latter occur as the root or fifth of a consonant triad; while no note possessing even the temporary character of a leading-note should be doubled. Thus, in the Phrygian cadence, at (*a*), it would be incorrect to double the *G* sharp, this note being the leading-note in *A* minor, whereas the *B* may be freely doubled, for, there cannot be two leading-notes in one and the same chord. In the **augmented triad** on *V*, it is best to treble the root, as at (*b*), or, if the seventh be present, to double the root:—

The musical notation shows two examples in a grand staff. Example (a) shows a Phrygian cadence with a G sharp in the treble and a B in the bass. Example (b) shows an augmented triad with a G sharp in the treble and a B in the bass. Below the staff are figured bass notations: 6 # and #5. In both examples, the root note (B) is doubled in both the treble and bass staves.

In the augmented triads on I and IV, the root may be trebled, or both the root and third may be doubled. In the Neapolitan sixth, it is permissible to double any note, the chromatic notes, in this case, being the root and fifth of the chord; in the major mode the third is generally doubled, as at (c), in the minor mode, the sixth, as at (d), as well as the bass in both cases:—

Two musical examples, (c) and (d), showing augmented triads in five-part harmony. Example (c) is in the major mode, and example (d) is in the minor mode. Both examples show the root and third of the triad trebled, and the fifth doubled. The notation is in treble and bass clefs, with a grand staff. Below the staff, the chord symbols are given: (c) $\flat 6$ 6 7, \flat 4 3; (d) $\flat 6$ 6 7, \flat 4 $\sharp 4$.

In the **Italian sixth**, a chord rarely employed in five-part harmony, the third should be trebled, as at (e); in the **French form** (f), either the third or the fourth may be doubled, and in the **German form** (g), the third should be doubled:—

Three musical examples, (e), (f), and (g), showing the Italian sixth, French form, and German form of the sixth chord in five-part harmony. Example (e) is the Italian sixth, (f) is the French form, and (g) is the German form. The notation is in treble and bass clefs, with a grand staff. Below the staff, the chord symbols are given: (e) $\sharp 6$; (f) $\sharp 6$ 4 3, $\sharp 6$ 5; (g) $\sharp 6$ 4 3, $\sharp 6$ 5.

With regard to other chromatic chords, the student must exercise discretion in the matter of doubling, basing his judgment on the general principles enunciated above.

312. **Six-part harmony**, in some respects, is the most ideal of all forms of part-writing; for, the usual arrangement of the vocal forces, namely, for S.S.A.T.T.B., enables the composer to write

for the high, middle and low voices of both men and women, and thus to employ the triad in its complete form for both male and female voices. Six-part writing not only admits of harmonic effects impracticable, of course, with fewer parts, but the treatment of the individual parts is much less complicated than when more than six are engaged; and even though a greater wealth of harmony, may be obtained in the latter case, yet it is often a question whether or not the result is an adequate compensation for the outlay of academic ingenuity necessary to manipulate so many voices.

Six-part harmony is based upon the general laws of four-part harmony, while the principles of doubling are practically the same as in five-part harmony. The doubling of the leading-note, as heretofore, is undesirable in all dominant discords, but in the triad on V it is permissible, if approached by contrary motion.

Quintuple suspensions, though rare, now become possible, as shown at (a):—

(a)

9	9	8
7	7	5
	6	3
	4	
	2	

In the **artificial tetrads**, the third (of the nominal root), the only free note, may be trebled; but in the first inversion, either the bass may be trebled, or both the bass and its third doubled. Chromatic chords, generally, are treated on the same lines as in five-part harmony, but the chromatic element in music naturally and of necessity becomes less practicable as the number of parts increase.

The following excerpt illustrates six-part harmony, in both the monophonic and polyphonic styles.

From "BONNIE BELLE,"
A Madrigal for Six Voices

Lento

pp

Soprano I

Will she lis - ten?

Soprano II

Will she lis - ten?

Alto

Will she lis - ten?

Tenor

pp

Who can tell?

Bass I*

pp

Who can tell?

Bass II

pp

Who can tell?

Basso continuo

Lento

6 4 3

*The first bass part should be taken by one third of the bass section and one third of the tenor section.

Does she love me? Would I

Does she love me? Would I

Does she love me? Would I

Would I knew! would I

Would I knew! would I

Would I knew! would I

6 4 #3 # - 6 -

Detailed description: This is a musical score for five-part harmony. It consists of seven staves. The first three staves are for voices (Soprano, Alto, Tenor) and the last three are for instruments (Bass, Treble, Bass). The key signature is one sharp (F#). The lyrics are: 'Does she love me? Would I' (first three staves), 'Would I knew! would I' (last three staves). The score includes various musical notations such as notes, rests, and dynamic markings like 'cresc.'. At the bottom, there is a figured bass line: 6 4 #3 # - 6 -.

dim. *Allegro*

knew! — I knew!

dim. *f* > > >

knew! — I knew! Just to please my

dim. *f* > >

knew! I knew! — to please my

dim.

knew! I — knew! —

dim. *f* > > >

knew! I knew! — to please my

dim. *f* > > >

knew! I knew! Just to please my

Allegro

6 6 - 7 5 1 1 4
 6 4 - 3 2
 4 2 -

Just to please my Bon - nie, Bon - nie

Bon - nie, Bon - nie— Belle, — my Bon - - nie

Bon - nie Belle,

Just to please my Bon - nie, Bon - nie—

Bon - nie, Bon - nie Belle,

Bon - nie, Bon - nie Belle, to please my Bon - - nie

6 4 6 6 5
3 3 4 3

più animato

Belle, Lo! — I sing a vill - an -

più animato

Belle, Lo! I sing a vill - an -

più animato

Lo! — I sing a vill - an - elle, ———

più animato

Belle, I sing a vill - an - elle, ——— a vill - an -

più animato

I sing, I sing I sing, I

più animato

Belle, ———

più animato

5 4 5 6 7 5 4 5 6 7
3 2 3 4 2 3 2 3 4 2

Musical score for five-part harmony, featuring vocal lines and guitar chords. The score is written in G major (one sharp) and 4/4 time. The vocal lines are arranged in five staves, each with a different clef (soprano, alto, tenor 1, tenor 2, and bass). The lyrics are: "elle, Just — to please my Bon - nie Belle, my sing, Just — to please my Bon - nie Belle, my". The guitar part is indicated by numbers 1-5 below the bottom staff.

The score consists of six systems of music. Each system includes a vocal line and a guitar line. The lyrics are: "elle, Just — to please my Bon - nie Belle, my sing, Just — to please my Bon - nie Belle, my". The guitar part is indicated by numbers 1-5 below the bottom staff.

The guitar part is indicated by numbers 1-5 below the bottom staff. The numbers are: 5, 9, —, 6, 4, 4, 4; 3, 8, —, 7, 4, 2, 2; —, —, —, —, —, —, —.

The musical score consists of five staves. The first four staves are vocal parts (Soprano, Alto, Tenor 1, Tenor 2) and the fifth staff is the piano accompaniment. All parts are in the key of D major (two sharps) and 4/4 time. The lyrics are: "Bon - nie Belle, — to please — my". The piano part features a melodic line with accents and a forte (*ff*) dynamic marking. The vocal parts also have accents and a forte (*ff*) dynamic marking. The piano part has a melodic line with accents and a forte (*ff*) dynamic marking.

Bon - nie Belle, — to please — my

Bon - nie Belle, — to please — my

Bon - nie Belle, — to please — my

Bon - nie Belle, — to please — my

Bon - nie Belle, — to please — my

Bon - nie Belle, — to please — my

7 4 6 - 4 #3 - 6
 5 2
 3
 2

rall. *a tempo*

Bon - - - nie Belle, _____

rall. *a tempo*

Bon - nie— Belle, my— Bon - nie, Bon - nie—

rall. *a tempo*

Bon - - - nie Belle, _____

rall. *a tempo*

Bon - nie Belle, my— Bon - nie, Bon - nie—

rall. *a tempo*

Bon - - - nie Belle, _____

rall. *a tempo*

Bon - - - nie Belle, _____

rall. *a tempo*

9 8 - 5 6 5 9 8 7
3 3 b 4 3 2

dim. poco a poco

my Bon - nie,

dim. poco a poco

Belle, my

dim. poco a poco

Lo! I sing a vill - an - elle, my

dim. poco a poco

Belle, I sing, I sing a

dim. poco a poco

My Bon - nie, Bon - nie

dim. poco a poco

8	4	5	6	7
3	2	3	4	-
			2	-

p calando pp

Bon - nie Belle. —

p calando pp

Bon - nie Belle. —

p calando pp

Bon - nie Belle, — my Bon - nie Belle. —

p calando pp

vill - an - elle, my Bon - nie Belle. —

p calando pp

Belle, — my Bon - nie Belle. —

p calando pp

9 8 - 7 5 4 5 6 5 —
 5 6 5 - 3 2 3 5 4 3 —
 4 - 5 4 — — — — —
 2 - 3 2 — — — — —

313. **Seven-part harmony** is of comparatively rare occurrence, composers, as a rule, preferring either six or eight parts. The arrangement of the voices is naturally S.S.A.A.T.T.B., as it is not customary or desirable, as a general rule, to divide the basses in less than eight-part writing. Seven-part harmony is governed by the general laws of eight-part harmony, which will be considered in the following section, but it may here be said that any relaxation in the laws of strict part-writing should only be taken advantage of in the case of otherwise unsurmountable difficulties.

The doubling of the dissonant note in V_7 , if this note is approached and quitted conjunctly, is permitted in writing for seven or more voices; so that a **sextuple suspension** is within the range of possibility, as shown at (a). Seven-part harmony also enables the composer to employ simultaneously all the notes of the diatonic scale, as exemplified at (b):—

(a) (b)

9	9	8	7	—
7	7	5	6	—
	6	3	4	—
	4		3	2
	2		2	—

314. **Eight-part harmony** is the highest and noblest form of part-writing, the final aim, the climax, in the study of harmony. There are two distinct methods of writing for eight voices, one, in which each of the voices is divided, the arrangement of voices being S.S.A.A.T.T.B.B., and the other, in which the voices are arranged as a double chorus, each comprising the usual four vocal parts. The latter is the more frequently employed, but the former

may also be regarded as a form of double chorus, one for male and the other for female voices. The general laws of eight-part harmony are, with certain relaxations or modifications, the same as those for four-part harmony. Infringements of the strict laws of part-writing, however, must not be made without due reason, and to one of these laws, indeed, there is still no exception, namely, that regarding consecutive fifths and octaves; and even to hidden consecutives, in relation to the extreme parts, it is desirable to attach the same importance as hitherto. Consecutives by contrary motion, on the other hand, may be employed with considerable freedom between the inner parts, or between an inner and an extreme part. To the doubling of the leading-note, when so many voices are engaged, there is but little objection, at the same time it is preferable perhaps not to double it, if any other disposition of the parts can be made. Crossing and overlapping of the parts are permissible, but awkward skips and movement by augmented intervals are objectionable, and should only be employed in cases of extreme difficulty. In the matter of doubling, the general principles are practically the same as in five and six-part writing; in this connection the student must employ discretion; and a careful analysis of the following example should be of material assistance. The greater the number of parts, the simpler will the harmonic progressions be, hence, the magnificent effects that are obtained from a double chorus do not arise from the individual chords so much as from the effective doubling of the notes and the skilful interweaving of the parts.

The following excerpt illustrates eight-part harmony, in both the monophonic and polyphonic styles:—

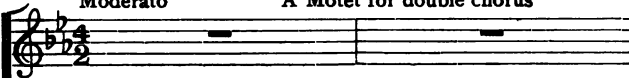
CHORUS I

Intrada and Coda from "Gloria Patri"

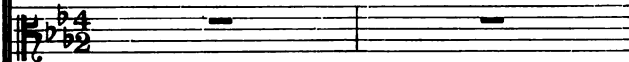
Moderato

A Motet for double chorus

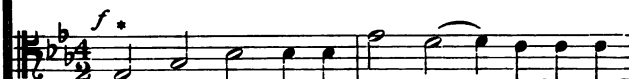
Soprano



Alto



Tenor



Glo - ry be to the Fa - ther,— and to the

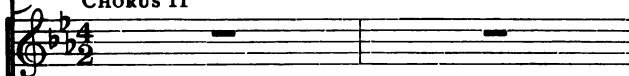
Bass



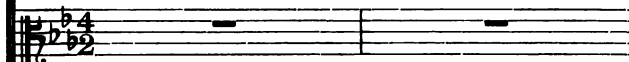
Glo - ry be to the Fa - ther,— and to the

CHORUS II

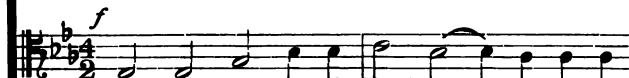
Soprano



Alto



Tenor

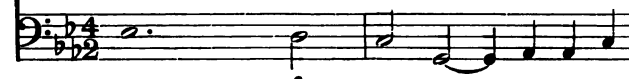


Glo - ry be to the Fa - ther,— and to the

Bass



Glo - ry be to the Fa - ther,— and to the

Basso
continuo

6

* Founded upon a Gregorian chant.

Glo - ry be to the Fa - ther, and to the Son,

Glo - ry be to the Fa - ther, and to the Son,

Son, and to the Ho -

Son, and

Glo - ry be to the Fa - ther, and to the Son,

Glo - ry be to the Fa - ther, and to the Son,

Son, and to the Ho - ly

Son, and to the Ho - ly

6

And to the Ho - - - ly

And to the Ho - ly

ly Ghost.

to the Ho - ly Ghost.

And to the Ho - ly Ghost, the Ho - ly—

And to the Ho - ly Ghost, the Ho - ly

Ghost, the Ho - ly— Ghost,

Ghost, the Ho - ly Ghost,

7

Ghost; As it was in the be - gin - ning, is

Ghost; As it was in the be - gin - ning, is

As it was, it was in the be - gin - ning, is

As it was, it was in the be - gin - ning, is

Ghost; As it was in the be - gin - ning is

Ghost; As it was in the be - gin - ning is

As it was, it was in the be - gin - ning is

As it was, it was in the be - gin - ning is

6
5

Detailed description: This is a musical score for a five-part harmony. It features five vocal staves (Soprano, Alto, Tenor 1, Tenor 2, and Bass) and a piano accompaniment. The key signature is B-flat major (two flats). The time signature is 4/4. The score is divided into two systems. The first system contains the first four staves, and the second system contains the remaining three staves and the piano accompaniment. The lyrics are: 'Ghost; As it was in the be - gin - ning, is'. The piano accompaniment starts with a forte (f) dynamic and includes a triplet of eighth notes in the right hand. The score ends with a double bar line and the numbers 6 and 5 below the bass line.

now and ev - er shall be, is now and ev - er shall —

now and ev - er shall be, A - - men, —

now and ev - er shall be, — is now and

now and ev - er shall be,

now and ev - er shall be, A - men, —

now and ev - er shall be, A - men, A -

now and ev - er shall be, A -

now and ev - er shall be,

7 8 7

be, world with-out

A - men, world with-out

ev - er shall-be, A - men, world with-out

world with-out

A - men, world with-out

men, is now and ev - er shall

men, A - men, world with-out

is now and ev - er shall-be, world with-out

4 6 8 b7
2 5

end, A - men, A - men, A -

end, A - men, A - men, A -

end, A - men, A - men, A -

end, A - men, A - men, A -

end, A - men, A - men, A -

be, A - men, A - men, A -

end, A - men, A - men, A - men, A -

end, A - men, A - men, A - men, A -

9 6 6 6 7 7 1 9 8
5 7 -

men. A men, A .

men. A men, —

men. A

men. A

men. A men,

men. A men, —

men. A

men. A

6 6 6 6 5 5 5 5 8 7

men,

A men,

men, A

men, A

A men,

A men,

men, A

men, . . . A . . .

6 5 4 3 - 8 7 6 5 6 5 6 5 8 7

A - men, A - men, A -
 A - - men, A - men, A -
 men, A - - men, A - - men, A -
 men, A - men, A - men, A -
 A - men, A - men, A -
 A - men, A - - men, A -
 . . . men, A - - men, A - - men, A -
 men, A - men, A - men,

6 5 4 3 - 8 7 8 b7 7 7 7
 # # #

men, A - - - - men,

- - - - men, A - - - - men, A -

- - - - men, A - men, A - - - - men, A -

men, A - - - - men,

- - - - men, A - - - - men,

men, A - - - - men, A -

- - - - men, A - men, A - - - - men, A -

A - men, A - men,

7 4 b4 3 4 1
b 2

A - men, A - men, A -
 A - - men, A - men, A -
 men, A - - men, A - - men, A -
 . . . men, A - men, A - men, A -
 A - men, A - men, A -
 A - men, A - - men, A -
 . . . men, A - - men, A - - men, A -
 men, A - men, A - men,
 6 5 4 3 - 8 7 8 b7 7 7 7
 #

FIVE-PART HARMONY

[illegible]

A - men, A - - - - men, A - - - -
 - - - - men, A - - - - -
 men, - - - - A - - - - men, A - - - -
 A - men, A - - - - - men, - - - -
 A - men, A - - - - men, A - - - -
 - - - - men, A - - - - men, A - - - -
 - - - - men, A - - - - -
 A - men, A - - - - -
 A - men, A - - - - -

6 5 6 6 7 6 7
 4 3 4 4 3 2 3

men, A - men, A - - men.—

men, A - men, A - - men.—

men, A - - men, A - - men.—

men, A - men, A - men.—

men, A - men, A - - men.—

men, A - men, A - - men.—

men, A - - men, A - - men.—

men, A - men, A - - men.—

1 b5 o 6
b -

Harmony for more than eight voices is very exceptional, but any number up to twelve, which seems to be the recognized limit, may be employed. In twelve-part harmony it is customary to divide the vocal forces into three distinct choirs, each comprising the usual four vocal parts. Mention may here be made of a Canon by Tallis (1515?-1585) for forty voices, but the composition, from a musical standpoint, is far from being satisfactory; it is more pleasing to the eye than to the ear, for, there is but one chord throughout. And even this number of parts has been exceeded by other mediæval contrapuntists; but whatever interest such compositions may possess from a scientific point of view, as works of art they are of no value at all, and since music has been compared with painting, so this type of tonal ingenuity may be compared with the vanishing point of the artist.

SUMMARY

§ 304. Two-part harmony.

Being written on a basis of intervals, it belongs to the realm of counterpoint rather than harmony.

§ 305. Three-part harmony.

The same as four-part harmony with one of the middle parts omitted; each chord should be as complete as possible.

§ 306. Five-part harmony. Triads.

§ 307. Five-part harmony. Tetrads.

§ 308. Five-part harmony. Pentads

§ 309. Five-part harmony. Artificial tetrads.

§ 310. Five-part harmony. Suspensions, etc.

§ 311. Five-part harmony. Chromatic chords.

§ 312. Six-part harmony.

§ 313. Seven-part harmony.

§ 314. Eight-part harmony.

The double chorus. Harmony for more than eight voices of rare occurrence.

EXERCISES

I

1. Give some account of two-part harmony. To what extent is this style of writing employed in music in its abstract form?
2. Explain the general principles in regard to omissions in three-part harmony.
3. Compare the treatment of the submediant chord in relation to the dominant in four-part and five-part harmony.
4. Explain the treatment of tetrads, both natural and artificial, in five-part harmony.
5. Write a chord of the dominant ninth in the key of *A* major, and show that the active notes of the scale, in combination, constitute a chord of motion which naturally proceeds to the passive notes, in combination as a chord of rest, the dominant itself being a bond of union between the two chords.
6. Illustrate a quadruple suspension.
7. Mention any general rules in reference to chromatic chords in five-part harmony.
8. Explain the general principles of six-part harmony.
9. Illustrate a quintuple suspension.
10. Write a short passage in seven-part harmony, in the key of *E* flat, introducing a chord comprising all the notes of the major diatonic scale.
11. Name the two methods of arranging the vocal forces in eight-part harmony, and exemplify the same, employing the cadences in ordinary use.
12. Mention any relaxations in regard to the strict laws of part-writing, permissible in eight-part harmony.

II

13. Introduce and resolve the following chords, *A* and *B* in *A* major, and *C* in *A* minor. Commence with the tonic and end with the perfect cadence, employing not more than four or five chords, in each exercise.

A

(a) (b) (c) (d) (e) (f)

B

(g) (h) (i) (j) (k) (l)

C

(m) (n) (o) (p) (q) (r)

14. Complete the following passage by inserting the chords indicated by the symbols. Figure the bass.

(a) (b) (c) (d) (e) (f)

(g) (h) (i) (j) (k) (l)

II⁷ I⁷ IV^{6x}₄ I⁹₇ VI^{6x}₅ I²

15. Add a second treble, alto and tenor parts to the following exercise:

8 9 8 — 6 — 9 8 7 — 8 7 — 8 7 9 8 8 9
 8 — 5 — 6 5 5 — 6 5 2 3 6 5 7 8 —
 3 4 3 4 3 4 3 # — 4 3 5 — 3 4
 3 #2 3 2

8 — #6 — 4 3 6 — 6 6 b7 6 5 8 — 6 b7
 5 — 5 4 #4 6 — #6 6 5 5 —
 3 4 3 4 — 2 b3 2 5 — #4
 3 #2 3 3 — 2 #2 3

9 8 b7 4 3 #2 3 5 6 b9 8 7 4 3 2 3 8 7
 5 b7 6 5 5 7 6 5 #

4 2 $\flat 7$ $\flat 5$ 9 8 7 7 — 6 7 6 7 7 9 — 8
 2 $\flat 5$ $\flat 5$ — 6 $\sharp 5$ 6 $\sharp 5$ 3 4 — 3
 3 4 3 4

Add two trebles, an alto and a tenor to the following basses:

16

8 $\sharp 7$ 9 8 6 7 9 9 8 — 6 9 8 — —
 7 4 3 7 8 7 6 5 5 7 — 6 7
 $\sharp 4$ 3 4 3 5 — 3 — 5 — 6 5
 2 3 — \sharp — 4 $\sharp 3$

$\sharp 7$ 8 8 — 6 5 8 — 9 8 $\flat 9$ 9 9
 5 — 7 — 7 — 8 — 7 7 8 $\sharp 7$ 8 $\sharp 7$
 4 3 6 5 6 5 5 — 5 5 5 — —
 2 4 $\sharp 3$ 2 3 4 3 \sharp 3 4 3 —

7 8 7 — 9 8 8 — 7 6 7 — 7 — 8
 6 5 5 $\flat 5$ 6 — 7 6 3 4 — 3 5 6 5
 4 3 4 5 — 4 — 3
 2 3 2 3

17

6 6 7 — 7 5 6 7 $\sharp 7$ 8 4 7 6 $\sharp 6$ $\sharp 6$ $\sharp 7$ 7 — \times 6 5 7
 4 4 3 \sharp 4 3 2 5 \sharp 5 — — 4 — $\sharp 3$
 \sharp

$\sharp 6$ 6 9 8 7 $\sharp 6$ 6 9 8 4 7 6 $\sharp 6$ 6 — 7 9 8 8 —
 4 \sharp 4 \sharp 5 4 4 — 3 7 $\sharp 6$ 5
 3 4 3 4 3
 2

18

Figured bass notation for exercise 18:

Staff 1: 7 4 3 7 - 6 4 3 7 - $\sharp 6$ 5 $\sharp 5$

Staff 2: $\sharp 5$ 6 - $\sharp 6$ 6 9 8 8 7 $\sharp 4$ 6 - 9 - 7 - 9 8 4 - $\sharp 3$ 2 5 $\sharp 6$ 4 $\sharp 5$ -

Staff 3: 9 8 9 8 9 8 6 - 4 $\sharp 6$ 6 $\flat 6$ 6 7 - $\sharp 7$ 8 - - 5 6 5 - - 7 - 7 - 7 - 6 5 4 3 6 4 - $\sharp 4$ 5 6 5 - - 4 - - 2 $\sharp 3$

III

19. To the following alto, add a treble and bass:

Exercise 19 consists of four staves of music in alto clef. The key signature is one sharp (F#) and the time signature is common time (C). The music is a single melodic line intended for an alto voice part.

20. To the following passage, add a first treble, an alto, a tenor and bass, employing diatonic chords only.



21. Clothe the following blank rhythm with melody, in the key of A flat, and harmonize the same for six voices.

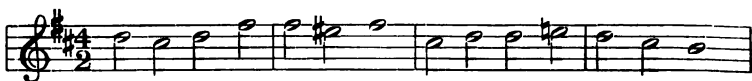
Largo



22. Add six upper parts, two trebles, two altos and two tenors, to the following bass:



23. Harmonize the following chorale for eight voices; modulate to an attendant key in each strain.





24. Harmonize the following basses for a double chorus:



Further exercises for practice in writing for other than four voices may be obtained from preceding chapters; for example:

Add a first or second treble, alto or tenor, to each of the chords in exercises 15, 16, 17, 18, Chapter V, and then complete the progressions in five-part harmony.

The basses, both figured and unfigured, in Chapters VIII, X, XII, XIV, XVI and XVIII, are specially recommended for five or more voices. In regard to melodies, which may be chosen from the above and other chapters, it will often be advisable to transpose them into higher keys.

CHAPTER XXVII

INSTRUMENTAL HARMONY

315. Musical instruments are of two kinds, harmonic and melodic. The former includes such instruments as the pianoforte, organ, and harmonium, and although melodies may be performed upon them, yet they are chiefly associated with harmony. The latter, which includes such instruments as the flute, trumpet and violin, is divided into two classes, strings and wind; upon wind instruments melodies only can be performed, and although harmony, to a limited extent, is practicable upon the stringed instruments, yet they are chiefly associated with melody. In the present chapter the pianoforte, the organ, and the members of the string quartet, alone will be considered.

A passing reference may here be made to the necessity for studying harmony from the *vocal* standpoint. It has already been said that all music is composed upon a mental basis of four-part harmony, and this theory of part-writing is very evident in all instrumental music, as well as vocal, except alone in music intended for harmonic instruments, and even in their case it is also evident when the music is of a contrapuntal character. In the highest type of abstract music, the symphony, every instrument is a part, and, indeed, what may be termed a pseudo-vocal part; for example, the flute is a treble, the second violin, an alto, the first bassoon, a tenor, and the third trombone, a bass. And although the compasses of these instruments exceed those of the corresponding voices, and although technical passages may be performed upon them which would be impracticable for the human voice, yet the principles of part-writing in orchestral music to all intents and purposes, are the same as those which obtain in the simplest form of four-part vocal harmony. It will be seen, therefore, that whatever success a composer might meet with in writing for the piano or organ, he could not hope to succeed in writing

orchestral music, without at least some acquaintance with the general laws of harmony and counterpoint.

It is desirable, moreover, if a composer wishes to succeed in instrumental composition, that he should have an intimate knowledge of the technique of the instrument for which he writes, and in order to meet with instant success, that he should also be a performer upon the same. No one, for example, could hope to write an ideal composition for the harp, unless he were a performer upon the instrument, and unless, at the same time, he understood its technical resources. It must be taken for granted, therefore, that the student possesses, at least, some knowledge of the instruments which are now about to be considered.

316. The pianoforte, from the composer's standpoint, is the most valuable of all instruments; it is, moreover, universally, the most popular of all. Its position in the world of music is due almost exclusively to its harmonic possibilities. Whether, as a solo instrument, or in combination with other instruments, or as an accompaniment to the human voice, it has attracted the attention of the greatest masters of modern music.

Although, as said above, music generally is composed on a basis of four-part harmony, yet in the case of music for the pianoforte, two voices only — the treble and bass — require special consideration (except, of course, in compositions that are constructed upon a contrapuntal basis), and, in this respect, the laws relative to the extreme parts in vocal music are equally applicable to instrumental. In the great majority of cases the middle parts are written freely, indeed, the term 'parts' is scarcely applicable. No rules can be laid down or even suggested in this connection; the genius of the composer, the resources of the instrument, and the particular effect demanded, will determine the treatment of the harmonic progressions.

In playing at sight from a figured bass, a test with which all students of harmony should be familiar, it is generally advisable to assign the bass part to the left hand, and the three upper parts, in close position, to the right; this plan is preferable to that of

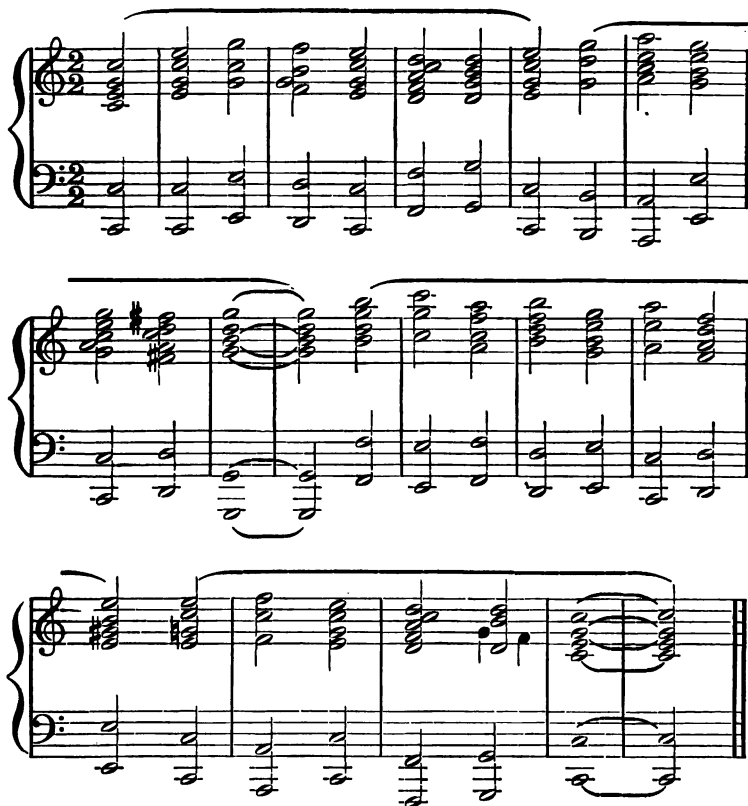
taking the tenor and bass with the left hand, and the treble and alto with the right. In harmonizing such basses, particular attention should be paid to the treble, for, a good melody will usually ensure correct inner parts. The following simple figured bass will serve as an illustration:



It may be harmonized in accordance with the above suggestions, thus:—

The three systems of musical notation show a piano arrangement. Each system has a grand staff (treble and bass clefs) with chords and a bass line. The first system shows a simple harmonic setting. The second system introduces more complex chords and a trill in the treble. The third system continues with complex chords and a trill in the treble.

The above passage may now be converted into a succession of massive chords for the pianoforte by playing the bass in octaves, and by playing the upper parts an octave higher, at the same time doubling the melody in 8ves, as shown in the following example:



In the face of the enormous wealth of music for the pianoforte at the command of the modern student, it would be superfluous to give examples; and the suggestion that he should study the same would not prove a source of much encouragement. From

Clementi, to whom is accredited the earliest compositions for this instrument, to Grieg, MacDowell and Debussy, is a long journey, and to traverse the same is a study in itself altogether apart from the subject under consideration. To one great master, however, special reference may be made, one whose name is intermediate, between the above-mentioned extremes, and one whose works, both vocal and instrumental, may well entitle him to be regarded as the student's model, namely, Mendelssohn; and the student is recommended to analyse the *Lieder ohne Worte*, wherein are comprised all the styles of pianoforte music with which at least he should be familiar.

317. **The organ**, the king of instruments, as it has been called, may be regarded as the result of an attempt to place as many different wind instruments as possible under the control of one performer. It may also be regarded, in a sense, as an orchestra, in which the string section is represented by the diapasons, and the other instruments by various stops, made to imitate them as closely as possible. The chief charm in the organ lies in its varied qualities of tone and its majestic volumes of sound. It is somewhat defective, however, in the matter of expression, for, notwithstanding that expression of a kind may be obtained by opening and closing the swell-box, yet even this, which is rarely practicable on more than one manual, must be regarded as general and not particular expression; that is to say, it applies equally to all the stops drawn on that manual. Such a feature as increasing the tone on one stop, and at the same time decreasing it on another, is altogether impracticable on the same manual. This lack of expression is probably the reason why so few of the great composers, since the rise of the romantic school, have written for the organ. Its many and varied qualities of tone, however, in a large measure compensate for any emotional defects, and its valuable function in connection with religious ceremonies will ever ensure its position in the world of art. There is practically no limit to the type of composition which can be performed upon a modern concert organ. Fugues, and movements of a contrapun-

al character generally, are especially suitable to, and effective upon this instrument, while trivial scale passages and scrambling arpeggios tend to degrade its noble character.

Four-part harmony is applicable to organ music on much the same lines as it is to music for the pianoforte; that is to say, the extreme parts should be arranged in accordance with the strict laws of part-writing, but no rules can be laid down with regard to the treatment of the inner parts. The above hymn-tune may be played on the organ, with the vocal parts intact, as in the following example, where the melody is assigned to a solo stop, the other three parts being employed as an accompaniment.

Gt. OR CH. *p* (SOLO STOP)

Manuals

Sw. *p*

Pedal

16' *p*

staccato

The first system of music consists of three staves. The top two staves are a grand staff (treble and bass clef) with a brace on the left. The bottom staff is a single bass clef staff. The second system also consists of three staves, with the top two forming a grand staff and the bottom being a single bass clef staff. The notation includes various musical symbols such as notes, rests, and accidentals.

A succession of massive chords may be obtained by assigning the bass to the pedals, the three upper parts to the left hand, and these upper parts, doubled an octave higher, to the right hand, as follows:

Sw. FULL *legato*

Manuals

GT. *f*

non legato
GT. TO PED. COUPLED

Pedal

The musical notation for 'Sw. FULL legato' is divided into two main sections. The top section, labeled 'Manuals', features a grand staff with a treble and bass clef, marked 'GT. f'. The bottom section, labeled 'Pedal', features a single bass clef staff marked 'GT. TO PED. COUPLED'. The notation includes various musical symbols such as notes, rests, and accidentals.

Other methods of playing hymn-tunes will be found in the standard works on organ-playing, but the following (rarely mentioned in such works) is an effective style, especially as an accompaniment, when all the voices are in unison.

Manuals

GT. WITH 8VE COUPLER

Pedal

GT. TO PED. COUPLED

sempre staccato

The first system of musical notation consists of three staves. The top staff is a grand staff (treble and bass clefs) with a key signature of one sharp (F#). It contains four measures of music, each with a whole note chord marked with an 'x'. The bottom two staves are bass staves. The middle bass staff contains four measures of music, each with a whole note chord. The bottom bass staff contains four measures of music, each with a whole note chord.

The second system of musical notation consists of three staves. The top staff is a grand staff (treble and bass clefs) with a key signature of one sharp (F#). It contains four measures of music, each with a whole note chord marked with an 'x'. The bottom two staves are bass staves. The middle bass staff contains four measures of music, each with a whole note chord. The bottom bass staff contains four measures of music, each with a whole note chord.

The third system of musical notation consists of three staves. The top staff is a grand staff (treble and bass clefs) with a key signature of one sharp (F#). It contains four measures of music, each with a whole note chord marked with an 'x'. The bottom two staves are bass staves. The middle bass staff contains four measures of music, each with a whole note chord. The bottom bass staff contains four measures of music, each with a whole note chord.

Here, the melody of the hymn-tune is played (in octaves) with the left hand, accompanying chords are played with the right, while a staccato pedal-part is formed from the original bass by varying the same in accordance with the rules applicable to the second species of counterpoint.

Further examples are unnecessary. Ample opportunity for the study of this branch of music is afforded in the works of composers from Bach and Handel down to Guilman and Rheinberger. The name of Mendelssohn may again be mentioned, for, he is one of the few great masters who, since the rise of the romantic school, have been inspired to write for the organ, and the student is recommended to analyse his six sonatas for this instrument, wherein are comprised all the styles of organ music with which at least he should be familiar.

318. **The string quartet** is a family of instruments which has engaged the attention of all the greatest composers from the days of Haydn, who founded the orchestra and established classic form, down to the present day. The members of this family comprise

1. The **first violin**, corresponding with the **treble**;
2. The **second violin**, " " " **alto**;
3. The **viola**, " " " **tenor**; and
4. The **violoncello**, " " " **bass**.

Each of these instruments has four strings which are tuned as follows:



The actual extent of each compass is indefinite; but it may be said to be about three octaves (or twice that of the average human voice) which is sufficient for all ordinary purposes.

Music for the string quartet, unlike that for the pianoforte and organ, *is* written in accordance with the general laws of four-part harmony. Music for a stringed instrument, however, differs from vocal music in three distinct features: (1) the range of pitch (compass) is more extended, (2) the style may be, and usually is, more florid, and (3) the 'bowing' must be indicated.

It may be taken for granted that the student has some knowledge of the technique and the resources of these instruments; if such be not the case, he may obtain sufficient information from any recognized work on orchestration. A brief reference, however, may be made to the important feature of bowing, which, at first, is often a source of trouble. On broad principles, the down stroke is used for strong beats, and the up bow, for weak; it frequently happens, therefore, that there are an even number of strokes in each measure, and it is rare, except in the case of syncopations, for a stroke to be carried over a bar-line. The most important sign in connection with the bowing is the slur, employed to indicate the number of notes to be taken by one stroke. The signs, \wedge or \vee , and \sqcap or \sqcup , representing respectively up and down bows, are available for use, but, as a matter of fact, are very rarely employed. The following example illustrates various methods in which the scale of *C* may be bowed; the effect in each case, to a certain extent, may be gathered by singing the syllables 'La', for the down, and 'Te' for the up bow, as indicated:—

(a) La, te, la, te, la, te, la, te.

(b) La, te, la, te.

(c) La, te, la, te.

(d) La, te.

(e) *(p)* La —————

(f) *(f)* La, te, la, te, la, te, la, te.

(g) *(p)* la - a - a - a, te - e - e - e.

(h) *(f)* La, la, la, la, te, te, te, te,

At (a) there is one note to each bow; at (b) two notes to each bow; at (c), three notes to the down bow, and one to the up; at (d) four notes to each bow; at (e) eight notes to the down bow; at (f) one note *staccato* to each bow; at (g) four notes to each bow, each separated; if played *forte* this style is termed *martellato*; if softly, and with springing movement, it is termed *spiccato* or *saltato*: at (h) there are four successive down bows, followed by four successive up bows.

The term '*pizzicato*' (usually abbreviated to '*pizz.*') indicates that the notes are to be plucked with the finger; and the return to the use of the bow, after a *pizzicato* passage is indicated by the expression '*col arco.*'

Intervals, triads, and even chords of four notes are possible on these stringed instruments. On the violoncello, however, one note only is preferable; the octave and the perfect fifth are sometimes employed, but they have a tendency to weaken the true bass. The following is an example of a musical sentence, for the string quartet:—

Moderato

Violin I *mf*

Violin II *mf*

Viola *mf*

Violoncello *mf pizz.*

arco

First system of musical notation, measures 1-4. The score is written for four staves: Treble (top), Treble (second), Alto (third), and Bass (bottom). The key signature is one sharp (F#). The time signature is 4/4. The notation includes various musical symbols such as notes, rests, and accidentals. The first measure contains a whole note chord. The second measure contains a half note chord. The third measure contains a half note chord. The fourth measure contains a half note chord. The notation is complex, with many notes and accidentals.

Second system of musical notation, measures 5-8. The score is written for four staves: Treble (top), Treble (second), Alto (third), and Bass (bottom). The key signature is one sharp (F#). The time signature is 4/4. The notation includes various musical symbols such as notes, rests, and accidentals. The first measure contains a whole note chord. The second measure contains a half note chord. The third measure contains a half note chord. The fourth measure contains a half note chord. The notation is complex, with many notes and accidentals.

The student is advised to analyse string quartets by the great composers, paying particular attention to the bowing, the disposition of the parts, and the general style of the music as compared with ordinary four-part vocal harmony. The following popular works of this class may be specially recommended for study:—

Quartet in <i>F</i>	Op. 71, No. 1,	Haydn
"	<i>D</i> mi. No. 2,	Mozart
"	<i>E♭</i> Op. 74,	Beethoven

Besides the string quartet, there are also the string trio and quintet, and occasionally one or more wind instruments are introduced, but sufficient has been said above to indicate the principles upon which four-part harmony is employed in works of this character.

319. The combination of the pianoforte with one or more orchestral instruments has appealed to the great composers generally; the pianoforte part being written upon the basis of four-part harmony, and the other instruments treated from the melodic standpoint. Orchestral instruments in combination with the organ, on the other hand, have rarely appealed to the great composers, not even to those who have written for the organ as a solo instrument. Nevertheless, attempts have been made in this direction, and further development may be in store for the future. Such instruments as two violins; violin and violoncello; violoncello and horn, trumpet or trombone; should prove effective in combination with the organ, the organ part being written, as in the case of the pianoforte, upon the basis of four-part harmony, and the other instruments treated from the melodic standpoint.

The pianoforte in combination with the organ, as an accompaniment to the chorus in an oratorio, results in an artistic ensemble, and is a happy means of overcoming the difficulty and expense of providing an orchestral accompaniment in connection with the productions of choral works in churches. The pianoforte under these circumstances, should be treated so as to represent, as far as possible, the string section of the orchestra; while, the organ

may be employed in a double capacity, either to supply the individual wind instruments of the orchestra, in the solos and the subdued numbers of the work, or as a support for the voices in the choral numbers.

320. The orchestra comprises the most important aggregation of musical instruments, and provides the most perfect ideal of tonal combination. In the symphony, the highest type of abstract music, is to be found the culmination of part-writing; and the union of the vocal and instrumental forces (as in the opera, oratorio and choral symphony) affords an opportunity for the display of the greatest resources of the science and art of harmony. The instruments of the orchestra may be divided into three distinct classes, namely,

1. **The strings**, which are treated on the lines already explained in connection with the String Quartet ;
2. **The wood-wind**, which, from the standpoint of four-part harmony, may be treated in various ways ; and
3. **The brass**, which may be subdivided into two classes, the **SOFT** — comprising the Horns, and the **LOUD** — comprising the Trumpets and Trombones.

The horns may be regarded as the male chorus (T.T.B.B.) of the orchestra, the female chorus (S.S.A.A.) being found among the flutes, oboes and clarinets. The trumpets and trombones furnish five-part harmony, the former the first and second treble, and the latter the alto, tenor and bass: for four-part harmony, one of these instruments may be omitted, or two of them doubled, either in the unison or the octave. Music for brass instruments is usually of a simple character, and more vocal in style than that for other instruments.

The wood-wind section, in relation to harmony, as said above, may be treated in a variety of ways. In this matter, no rules can be laid down; the student can hope to master the subject only by experience, which can best be obtained from a careful examination of the scores of the great composers. The following table furnishes some of the more usual methods of employing four-part harmony for the wood-wind instruments: —

S.	F i	O i	C i	F i-i.	F i O i	F i O i C i	(8ves) F i (F ii O i
A.	F ii	O ii	C ii	O i-ii	F ii O ii	F ii O ii C ii	O ii C i
T.	B i	B i	B i	C i-ii	C i-ii	B i	C ii
B.	B ii	B ii	B ii	B i-ii	B i-ii	B ii	(B i B ii (8ves)
F-Flute, O-Oboe, C-Clarinet, B-Bassoon.							

In each family of instruments it is generally desirable for the lowest member to take the correct bass of the harmony, unless indeed the individual instruments are under solo treatment. Additional instruments are occasionally employed to strengthen or modify individual parts; for example, the piccolo, to strengthen the melody an octave higher in the woodwind section; and the double bassoon, to strengthen the bass an octave lower; while, the cor anglais and basset horn, etc., strengthen or modify the inner parts. The harp, when employed in the orchestra, is treated as a harmonic rather than a melodic instrument, and four-part harmony is adapted to it in the usual form of arpeggios.

With regard to the analysis of orchestral scores, the student is advised to study the symphonies of Beethoven; a careful examination of Nos. 1, 3, 5, 7 and 9, which may be specially recommended, will prove of invaluable assistance to him in writing for the orchestra. In analyzing these symphonies, it is necessary (1) to determine the form employed for each movement, (2) to figure the bass throughout, and (3) to examine the treatment of the individual instruments; but, above all things, the student should endeavor, through the medium of tonal-vision, to obtain a thorough appreciation of the orchestral effects. A pianoforte transcription of the composition, moreover, when obtainable, will often save much time, and be otherwise useful.

The following excerpt* illustrates a chorus with full orchestral accompaniment.

*From "A Song of Thanksgiving," a Cantata for Soli voices, Chorus and Orchestra.

Moderato
8va.....

Flute I & II

Oboe I & II

Clarinets I & II
in *B \flat*

Bassoon I & II

I & II
Horns in *F*
III & IV

Trumpet I & II
in *B \flat*

Trombone
Alto and Tenor

Bass Trombone

Kettle Drums
in *C & G*

Cymbals
Great Drum

Chorus

Soprano

Alto

Tenor

Bass

Violin I

Violin II

Viola

Violoncello

Double Bass

Harp

Glo - - - - - ry and

Glo - - - - - ry and

The score is a page from a musical manuscript, page 615, titled 'INSTRUMENTAL HARMONY'. It features a chorus of four voices (Soprano, Alto, Tenor, Bass) and a string quartet (Violin I, Violin II, Viola, Violoncello) along with a Double Bass and Harp. The vocal parts are in the upper system, and the instrumental parts are in the lower system. The lyrics for the vocal parts are 'Glo - - - - - ry and'. The instrumental parts are written in various staves, with some parts having multiple staves (e.g., Violin I and II, Viola, Violoncello, Double Bass, and Harp). The notation includes notes, rests, and other musical symbols.

This musical score is for a piece titled "INSTRUMENTAL HARMONY" on page 616. It features a complex arrangement of staves. The top system consists of three staves: the upper staff contains a series of eighth notes, the middle staff contains a series of eighth notes, and the lower staff contains a series of eighth notes. The middle staff of the top system is marked with a "dim." (diminuendo) instruction. The bottom system consists of three staves: the upper staff contains a series of eighth notes, the middle staff contains a series of eighth notes, and the lower staff contains a series of eighth notes. The middle staff of the bottom system is marked with a "dim." (diminuendo) instruction. The score is written in a style that suggests a 19th-century manuscript, with a focus on harmonic structure and melodic lines. The notation includes various musical symbols such as notes, rests, and dynamic markings.

wor - - - ship

are

be

fore

Him

p

f

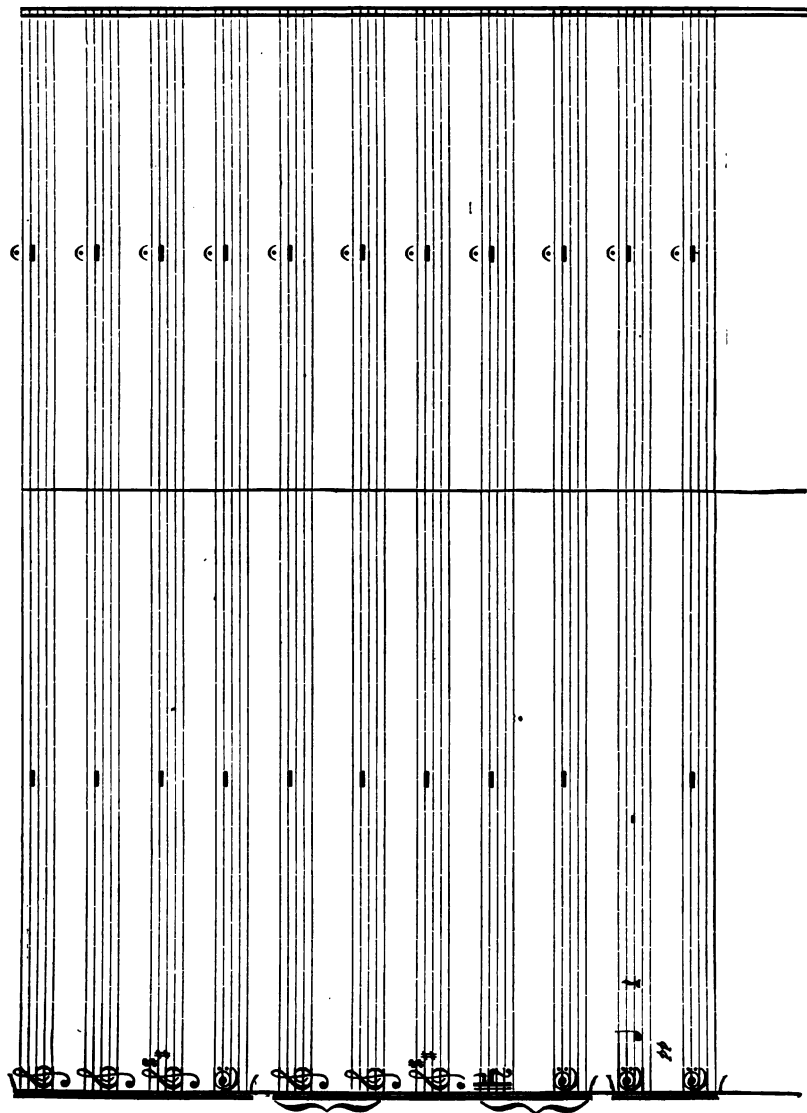
dim.

loco

sempre legato

This musical score is for a piece titled "Instrumental Harmony" on page 618. It features a complex arrangement of staves, likely for a string quartet or similar ensemble. The score is divided into two main systems by a vertical line. The left system contains staves with various musical notations, including a section marked "8va" (octave) and "ff" (fortissimo). The right system continues the composition, featuring a section marked "dim." (diminuendo) and "tr" (trill). The notation includes a variety of note values, rests, and dynamic markings, all set against a background of horizontal staves.

The musical score is written for piano and voice. The vocal line is in the upper staff, and the instrumental line is in the lower staff. The vocal line has lyrics: "pow - - - er and hon - - - or,". The instrumental line features various musical notations, including "loco", "dim.", and "f". The score is divided into two systems by a vertical line. The first system contains the vocal line and the instrumental line. The second system contains the vocal line and the instrumental line. The vocal line is written in a single staff, and the instrumental line is written in a single staff. The vocal line is in the upper staff, and the instrumental line is in the lower staff. The vocal line has lyrics: "pow - - - er and hon - - - or,". The instrumental line features various musical notations, including "loco", "dim.", and "f".



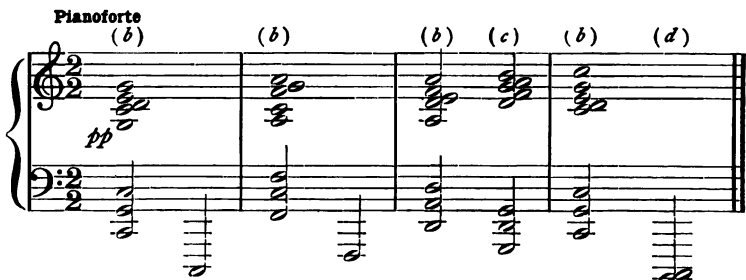
are in His sanc tua

sempre legato

321. In conclusion, a brief reference may be made to certain chords in which the dissonant element is introduced in an exceptional manner. The idea of *adding* notes, other than a seventh or ninth, to a consonant triad has already been exemplified in the chord of the Added sixth, but the added note, even in this case, is susceptible of a freedom of treatment not usually associated with this chord. Thus, at (a) the added note is treated in the same manner as though it were a consonant note of the chord, which may be termed, therefore, the chord of the *independent sixth*:



The addition of one diatonic note would naturally suggest the addition of another, and thus, the chord of the *independent second* might arise, as exemplified at (b) or, with the seventh also present, as at (c):



The presence of the second in the above examples is more or less justified by the harmonic chord of nature, in which the ninth harmonic is heard simultaneously with the eighth and tenth harmonics. The dissonance at (d) is an instance of harmonic

illusion, the number of beats in this case approximating the number of vibrations which would arise were the *C*, an octave below, heard instead of the *B*. The chord of the independent fourth is also possible, but the effect of this chord is by no means as pleasing as that of the independent second. These independent notes, it will be seen, may be employed in either their melodic form, as at (*a*), or in their harmonic form, as at (*b*) and (*c*).

The minor seventh may also be employed as an independent note, as incidentally mentioned in Chapter XX, section 231; this note, being the first departure from consonance in the harmonic chord of nature, its presence is even more justifiable than that of the major second. The following passage, (*e*) exemplifies a succession of primary tetrads, in which the seventh is introduced without regard to its resolution:



There is, indeed, practically no limit to the employment of the dissonant element in music. The seven diatonic notes in simultaneous combination has already been exemplified, section 313, and a few examples of chords, in which the chromatic element is introduced, may assist the student in the matter of employing these exceptional harmonic effects, should occasion arise for their use. The chords at (*f*) and (*g*):



both modifications of the dominant chord in the key of *C* major, illustrate two entirely different types of harmonic extravagance. The chord at (*f*) may be introduced as at (*h*), where the upper notes are treated as an inverted compound pedal, and the lower notes, as a short chromatic passage of chords of the sixth.



The chord at (*g*) may be introduced as at (*i*) on the theory again of harmonics, each note of the triad becoming a generator, the fourth and fifth harmonics of which are actually present, in addition to being (as they always are) theoretically present:

The above passage is written for the organ in order that the notes on the Swell manual may be more or less lost in the louder tones of those on the Great. An effect on somewhat similar lines may be obtained by playing a triad on a *diapason* and a *mixture* containing the seventeenth and nineteenth.

Finally, the following passage exhibits, at (*j*), the possibility of even combining simultaneously all the notes of the chromatic scale, the most extravagant harmonic effect in music: —

Flutes I & II

Oboes I & II

Clarinets I & II
in C

Bassoons I & II

I II

Horns in F
III IV

Trumpets I & II
in C

Alto and Tenor
Trombones

Bass Trombone
and Tuba

Kettle Drums
in C and G

Violin I

Violin II

Viola

Basses

tr

The extent to which the dissonant element in music may or should be employed must be left to the discretion of the composer. A dramatic situation may necessitate the use of exceptional chords for the portrayal of an emotional effect, but the dictates of good taste must be called into requisition in order to draw the line at the right and proper point. If the effect be artistic, however, it is evident that the means will justify the end.

SUMMARY

§ 315. Harmonic and melodic instruments.

The necessity for studying four-part vocal harmony, the rules relative to the extreme parts being practically as stringent in instrumental as in vocal music.

§ 316. The Pianoforte.

§ 317. The Organ.

§ 318. The String quartet.

Strict adherence to the general laws of four-part harmony is necessary, and particular attention must be paid to "bowing."

§ 319. Instruments in combination.

The pianoforte and organ, an effective substitution for the orchestra as an accompaniment in choral works.

§ 320. The Orchestra.

Four-part harmony is generally applicable to each of the constituent families — the strings, wood-wind and brass.

§ 321. Exceptional chords.

The independent sixth, and second, etc., and various extravagant harmonic effects.

EXERCISES

I

1. Mention any reasons why a knowledge of four-part vocal harmony is desirable, if not necessary, in writing instrumental compositions.

2. Explain the general principles upon which four-part harmony is applicable to compositions for the pianoforte and organ.

3. Name the instruments which constitute the string quartet. Give their tunings, and the general compass of each.
4. Mention the three important points wherein instrumental melodies may differ from vocal melodies.
5. Write the lower tetrachord in the key of C, and show various methods of bowing the same.
6. Classify the instruments which comprise the modern orchestra.
7. Explain the general principles upon which four-part harmony may be adapted to the brass instruments.
8. Mention various methods of arranging four-part harmony for the wood-wind instruments.
9. Describe, and give examples of the chords of (a) the independent second, and (b) the independent sixth.
10. Give two or three examples of chords illustrating extreme harmonic extravagance.

II

II. Continue the following trio for two violins and violoncello for about sixteen measures; maintain the canon between the upper parts, modulate to the key of the dominant, and conclude with a free coda.

Allegretto

The musical score is for a trio of two violins and a cello. It is written in 6/8 time, key of D major (two sharps), and marked 'Allegretto'. The score consists of three staves. The first two staves are for violins and the third for cello. The music is a canon, with the second violin part starting one measure later than the first violin. The first measure of the first violin is a whole rest. The second measure of the first violin is a quarter rest. The first violin part begins with a quarter note D5, followed by eighth notes E5, F#5, G5, A5, B5, C6, and D6. The second violin part begins with a quarter note E5, followed by eighth notes F#5, G5, A5, B5, C6, and D6. The cello part begins with a quarter note D4, followed by eighth notes E4, F#4, G4, A4, B4, and C5. The music concludes with a final cadence in the key of D major.

Harmonize the following melodies for a string quartet.*

12

Andante



13

Allegro vivo



*Additional melodies, from string quartets by the great composers, will be found on page 633.

Musical score for "The Rose Tree" in G major, 2/4 time. The score consists of ten staves of music. The key signature has one sharp (F#). The melody is written in treble clef. The score includes various musical notations such as eighth notes, quarter notes, and half notes, often beamed together. Trills are marked with "tr" above the notes. The piece concludes with a double bar line.

I 4

Moderato

The musical score consists of ten staves of music, all in treble clef. The key signature is B-flat major (two flats: B-flat and E-flat), and the time signature is 4/4. The music is marked 'Moderato'. The first staff begins with a whole rest followed by a quarter rest, then a series of eighth and quarter notes. The second staff continues with eighth and quarter notes, ending with a whole rest. The third staff starts with a whole rest, followed by eighth and quarter notes. The fourth staff features a more active melody with eighth and quarter notes. The fifth staff continues with eighth and quarter notes, ending with a whole rest. The sixth staff begins with a series of eighth notes, followed by quarter notes. The seventh staff continues with eighth and quarter notes. The eighth staff features a series of eighth notes, followed by quarter notes. The ninth staff continues with eighth and quarter notes. The tenth staff concludes the piece with a series of eighth and quarter notes, ending with a whole rest.

15. Convert the following passage into an interesting theme, and harmonize it as a ground bass, for two violins, two violas, and violoncello.



16. Compose a Romance, for the pianoforte, in the key of *E* flat; employ the following (simple ternary) form:

Part I	Part II	Part III
Intrada, ad lib. (4). A. Normal sentence (8), in the key of the tonic.	B. Episodal sentence (8), in the key of the dominant.	C. Normal sentence, repetition of A. Coda, ad lib. (4).
The figures in brackets indicate the number of measures.		

17. Compose a March, for the organ, in the key of *A*; employ the following (simple binary) form:

Part I	Part II
A. Binary sentence (16): Period i, ending with imperfect cadence; period ii, ending with perfect cadence in the key of the dominant. Repeat Part I.	B. Episodal sentence (16): commencing in the key of the relative minor, and ending on the dominant of the original key. C. Sentence A, modified, Period ii, ending in the tonic key.
The figures in brackets indicate the number of measures.	

Sentence A should consist of massive chords, and sentence B—for contrast—may be a melody, with an accompaniment consisting of simple arpeggios or repeated chords. Write the principal theme for the great organ *ff*, coupled to the full swell; and write the subsidiary theme for a solo stop on the choir, with an accompaniment on the swell.

18. Harmonize the following melody, and then transcribe the same for the modern orchestra; score the Intrada for woodwind and strings; the Song, for a French horn solo, with string accompaniment; and the Chorus and Coda for the full orchestra.

Alla marcia
(INTRADA)
f

(SOLO)

ten.

ten. (CHORUS)

ten. Coda

The musical score consists of six staves of music in 4/4 time. The first staff is labeled 'Alla marcia (INTRADA)' with a forte 'f' dynamic. The second staff is labeled '(SOLO)'. The third staff has a 'ten.' (tenu) marking above it. The fourth staff has a 'ten.' marking above the first measure and '(CHORUS)' above the second measure. The fifth staff is unlabeled. The sixth staff has a 'ten.' marking above the first measure and 'Coda' above the second measure. The music features a variety of note values, including eighth and sixteenth notes, and rests, with some measures containing beamed sixteenth notes.

ADDITIONAL MELODIES

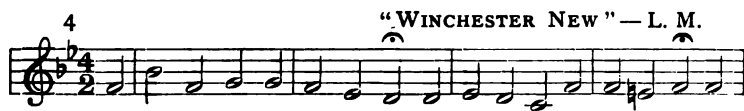
The following melodies may be harmonized in various ways. Any or all of the seven different styles, as explained in chapter xxiv, may be exemplified. The melody may be transferred to an inner voice, or even assigned to the bass. Besides the ordinary four-part harmony, the melodies may be harmonized for three voices, or for five or more voices; and, if desirable, they may be transposed into other keys. Too much attention, indeed cannot be paid to this important subject, which, as has already been said, may be regarded as the end and aim of the academic study of Harmony.

A.—CHORALES

I "TALLIS"—C. M.

2 "BRISTOL"—C. M.

3 "MELCOMBE"—C. M.





9

"WINDSOR"—C. M.



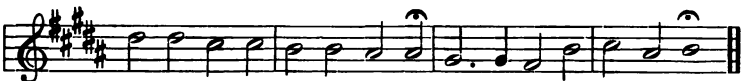
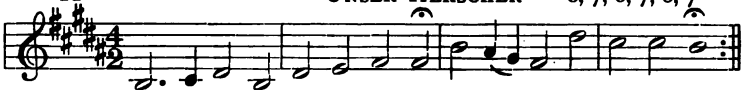
10

"LUDLOW"—S. M.



11

"UNSER HERSCHER"—8, 7, 8, 7, 8, 7



12

"ALL SAINTS"—8, 7, 8, 7, 7, 7



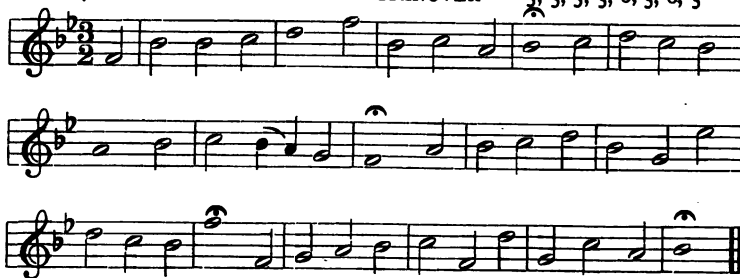
13

"S. THEODULPH"—7, 6, 7, 6, 7, 6, 7, 6



14

"HANOVER"—5, 5, 5, 5, 6, 5, 6, 5



15

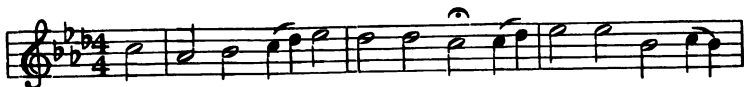
"WIE SCHÖN LEUCHET"—Irregular





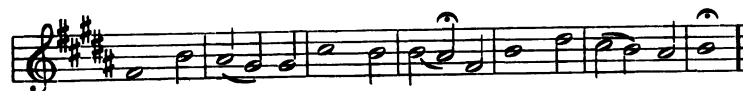
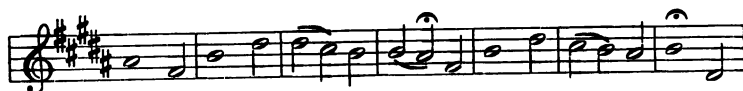
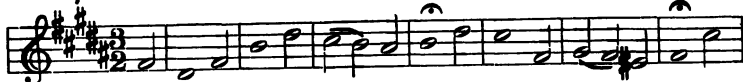
16

"INNSBRUCK"—8, 8, 6, 8, 8, 6



17

"ST. MATTHEW"—D. C. M.



18

"ERK"—8, 7, 8, 7, 8, 8, 7





19

"BUCKLESBURY"—D. L. M.



20

"PASSION"—7, 6, 7, 6, 7, 6, 7, 6



B.—PLAIN-SONG MELODIES

21 "VENI EMMANUEL"

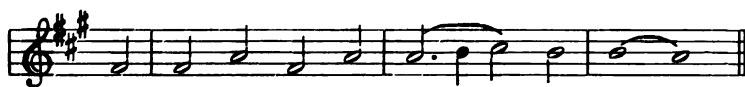
Four staves of musical notation for the melody "VENI EMMANUEL". The key signature is one sharp (F#). The melody is written in a single line across four staves. It begins with a treble clef and a key signature of one sharp. The notation includes various note values, rests, and phrasing slurs. The piece concludes with a double bar line.

22 "CORDE NATUS"

Four staves of musical notation for the melody "CORDE NATUS". The key signature is one sharp (F#). The melody is written in a single line across four staves. It begins with a treble clef and a key signature of one sharp. The notation includes various note values, rests, and phrasing slurs. The piece concludes with a double bar line.

23 "VEXILLA REGIS"

Two staves of musical notation for the melody "VEXILLA REGIS". The key signature is three sharps (F#, C#, G#). The melody is written in a single line across two staves. It begins with a treble clef and a key signature of three sharps. The notation includes various note values, rests, and phrasing slurs. The piece concludes with a double bar line.



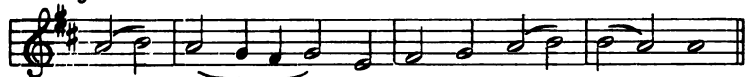
24

"O FILII"



25

"O LUX BEATA"



26

"JESUS DULCIS MEMORIA"





27

"PANGE LINGUA"



28

"URBS BEATA"



C.—NATIONAL ANTHEMS

29

"THE STAR-SPANGLED BANNER"—America





30

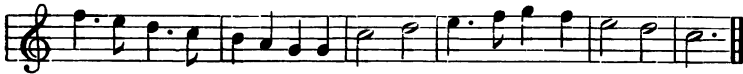
"HYMN TO THE EMPEROR" — Austria



31

"KING CHRISTIAN" — Denmark





"THE MARSEILLAISE"—France



33

"THE WATCH BY THE RHINE"—Germany





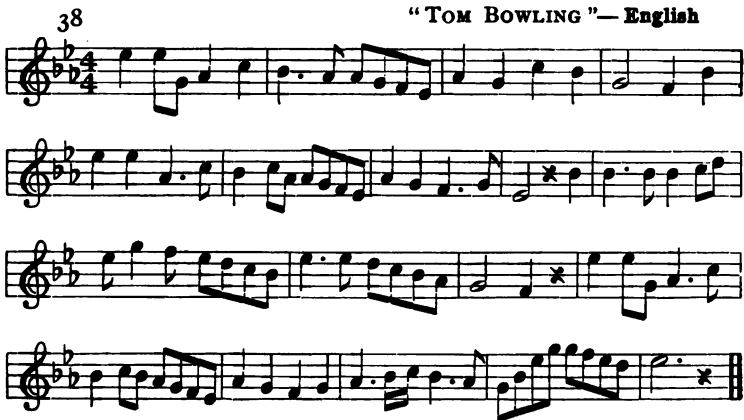


D.—FOLK-SONGS

"HEARTS OF OAK"—English



"TOM BOWLING"—English



39

"MY LODGING IS ON THE COLD GROUND"—English

40

"SALLY IN OUR ALLEY"—English

41

"THERE WAS A JOLLY MILLER"—English



42

"DOWN AMONG THE DEAD MEN"—English



43

"SCOTS, WHA HAE"—Scotch



44

"LOCH LOMOND"—Scotch



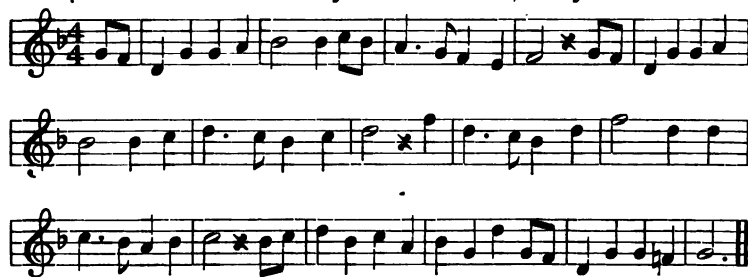
45

"CHARLIE IS MY DARLING"—Scotch



46

"JOHN ANDERSON, MY JO"—Scotch



47

"THE HARP THAT ONCE"—Irish



48

"THE MINSTREL BOY"—Irish



49

"OFT IN THE STILLY NIGHT"—Irish



50

"WHEN LOVE IS KIND"—Irish



51

"ALL THROUGH THE NIGHT"—Welsh



52

"MEN OF HARLECH"—Welsh



53

"THE OLD FOLKS AT HOME"—American





54

"MY OLD KENTUCKY HOME"—American



55

"MINE EYES HAVE SEEN THE GLORY"—American



"HAIL COLUMBIA"—American



E.—OPERATIC AIRS

"SOFTLY SIGHS THE VOICE OF EVENING"

57

Der Freischütz.—Weber

58

"AH! 'TIS THE LOVE THAT MOVES THE SPHERES"

La Traviata.—Verdi

59

"DO NOT MINGLE ONE HUMAN FEELING"

Moderato

La Sonnambula.—Bellini

60

"MORE GRAND IS HIS HUMBLE ESTATE"

Ardante

La Reine de Saba.—Gounod

61

"O TENDER SHADOW, THAT HOVER'ST NEAR"

Allegro

Dinorah.—Meyerbeer



62

"VISION ENCHANTING, MY SPIRIT HAUNTING"

Allegretto

Semiramide.—Rossini



63

"I VOW THAT NOTHING SHALL PREVENT ME"

Carmen.—Bizet

Andantino



64

"YET CAN THE SPECTRE SEAMAN BE FREED"

Der fliegende Holländer.—Wagner

Lento



65

"OH, WEEP! OH, WEEP, MINE EYES"

Le Cid.—Massenet

Lento



66

"LAST NIGHT IN THE DEEP, DEEP SEA"

Andante

Mefistofele.—Boito

F.—STRING QUARTETS

67

From Quartet in B flat major, Op. 71, No. 1.

Vivace

Haydn



68

From Quartet in *D* minor, No. 2.

Mozart

Andante

p *tr* *mf* *p* *cresc.* *f* *p* *mf* *p* *f*

69

From Quartet in *B* flat major, Op. 18, No. 6.

Beethoven

Adagio

p *p*

70

From Quartet in *D* minor, Op. No. 6, posth.

Schubert

Allegro

p



71

From Quartet in *F* major, Op. 41, No. 2.

Schumann



72

From Quartet in *D* major, Op. 44, No. 1.

Mendelssohn



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APPENDIX III

HARMONICS

I. The Sound Wave. The scientific origin of harmony is to be found in Acoustics, the science which treats of "sound" generally. A musical sound is the result of regular or periodic vibrations in the air. Musical sounds may also, as a matter of fact, be produced in both liquids and solids, but, in relation to harmony, gas, the atmosphere in which we "live and move and have our being," is the only medium necessary for consideration. Sound waves, or vibrations, as they are more frequently called, possess three properties, namely:

1. **Amplitude**, upon which the force (degree of loudness) depends ;
2. **Length**, upon which the pitch (acuteness or gravity) depends ;
3. **Character**, upon which the quality (string or wind, etc.,) depends.

Sound waves are spherical in form, and are due to the alternate condensation and rarefaction of atmospheric molecules. These alternations of density in the sound wave are closely allied with, respectively, the crests and troughs of water waves; indeed, sound waves may be graphically represented by water waves, in which case the latter are regarded as the *associated* waves of the former. Theoretically, sound waves diminish in intensity in inverse proportion to the square root of the distance traveled, practically, however, this law is rarely applicable, and more particularly in buildings, on account of the reflection and refraction (echoes) of the vibrations.

Vibrations are calculated according to their frequency (number) per second. Middle *C*, according to philosophical pitch, has 256 vibrations. The vibration number of a sound may be verified by means of tonometry.¹ As sound travels at the rate of about 1,120 feet per second, in ordinary temperature (60 degrees Fahrenheit), the length of a sound wave may be determined from the formula

$$\frac{1120}{V_n} = W_l$$

Where V_n is the vibration number, and W_l , the wave length.

Thus, the wave length of middle *C* is

$$1,120 \text{ ft.} \div 256 = 4 \text{ ft. } 4 \text{ in.}$$

In like manner, if the wave length is known, the vibration number of the sound may be found. Thus,

if $W_l = 16 \text{ ft.}$, then,

$$V_n = 1,120 \text{ ft.} \div 16 = 70$$

Again, if both wave length and vibration number are known, then the rate of travel and even the temperature may be found. Thus, if $W_l = 8 \text{ ft.}$, and $V_n = 136$, then the rate of travel will be ($W_l \times V_n$) 1,088 ft. per second, which is slightly under freezing point. Sound travels at the rate of 1,090 ft. per second at freezing point (32 degrees, Fahrenheit), and increases in speed at the rate of about one foot for each degree of rise in temperature.

II. Pitch. Philosophical pitch² is obtained on the assumption that (in the depths of the imagination) there is a note — it is called *C*. — with one vibration only per second.³ The octave above this note has two vibrations; the next octave, four vibrations; the next, eight, and so on, the vibration number being doubled with each succeeding octave. The *C* with sixteen vibrations is the *first* of the series to enter the realm of music, its predecessors being inaudible.

¹ The most important tonometers are: the monochord (or sonometer), Savart's toothed wheel: Latour's syren: Helmholtz' double syren: Mayer's graphic method: McLeod's cyclostyle: and the reed and tuning-fork tonometers.

² According to International pitch, which is generally adopted at the present day, *C*, the third space in the treble, has 517.3 vibrations.

³ The third letter of the alphabet is employed, instead of the first, from historic considerations, the modern scales having been evolved from the mediæval scales, which were adopted from the Greeks, and which commenced naturally with a note called *A*.

The following table, which should be read upwards, comprises the various octaves in relation to this note *C*, available in music :—

Fig. 1

	Length of string or pipe	Vibration number	Wave length, in feet	General particulars as to use in music.
<i>C⁴</i>	1½ in.	4096	$\frac{1}{4}$	Highest note* on the pianoforte, organ and piccolo.
<i>C³</i>	3 in.	2048	$\frac{1}{2}$	Highest note* on the violin and flute.
<i>C²</i>	6 in.	1024	1	Highest note* in vocal music.
<i>C¹</i>	1 ft.	512	2	Highest note* of the alto voice, and French horn; lowest note* on the piccolo.
<i>C</i>	2 ft.	256	4	Middle <i>C</i> , the standard of pitch, the middle line of the great stave; the highest note* of bass voice and double bass; the lowest note* of soprano voice, flute and oboe.
<i>C₁</i>	4 ft.	128	8	Tenor <i>C</i> , lowest note on the viola; lowest note* of tenor voice.
<i>C₂</i>	8 ft.	64	16	Lowest note on the violoncello and harp; lowest note* in vocal music.
<i>C₃</i>	16 ft.	32	32	Lowest note* on the pianoforte, harmonium and double bassoon.
<i>C₄</i>	32 ft.	16	64	Lowest note on the organ.

* Approximate

The highest and lowest octaves in the above table, from a musical standpoint, are of very little use to the composer. *C⁵*, with 8192 vibrations, is distinctly audible, and, indeed, *C⁶*, with 16,384 vibrations, and even possibly *C⁷*, with 32,768; but these extremely high notes are very shrill, and unavailable for musical purposes. Beyond this point, the human ear ceases to appreciate musical sounds.

III. The Harmonic Series. The division of a stretched string into its aliquot parts, from which (as explained on page 45)

the "common chord of nature" is obtained, may be continued indefinitely; for, just as the number of equal parts into which any whole may be divided, is theoretically infinite, so the harmonics (overtones or upper partials) obtainable from the string, are also theoretically infinite.

The following paradigm illustrates the harmonics obtainable from the note *C* up to No. 20 in the series.

Fig. 2

Symbols.	I	I	V	I	III	V	I	II	III	IV	V	VI	VII	L	I	-II	II	-III	III
Alphabetical name.	<i>C</i> ₂	<i>C</i> ₁	<i>G</i> ₁	<i>C</i>	<i>E</i>	<i>G</i>	<i>B</i> _b	<i>C</i> ₁	<i>D</i> ₁	<i>E</i> ₁	<i>F</i> ₁	<i>G</i> ₁	<i>A</i> ₁	<i>B</i> _b	<i>C</i> ₂	<i>D</i> ₂	<i>E</i> ₂	<i>F</i> ₂	<i>G</i> ₂

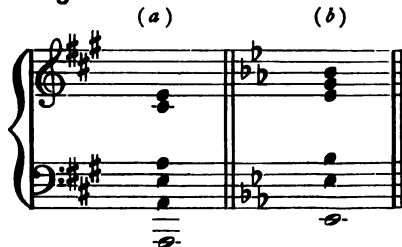
Order and Ratio.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Division of string.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Vibration number.	64	128	192	256	320	384	448	512	576	640	704	768	832	896	960	1024	1088	1152	1216	1280

The harmonics are computed from their position in relation to the generator. Middle *C*, for example, though really the third harmonic of *C*₂, is regarded as the *fourth* harmonic, that is to say, it is the fourth note in the series of harmonics of which *C*₂ is the first or generator; thus, its position in the series, its vibration ratio, and the length of string or pipe, from which it is obtained, are all indicated by the use of one and the same figure.

It should be noticed that the successive intervals in the above paradigm constantly diminish in size; first, the octave, then the fifth, the fourth, the major and minor thirds, and lastly, the major and minor seconds. Wherefore, it follows, that, from the standpoint of equal temperament, all the notes in the series, except alone the generator and its successive octaves, are more or less out of tune. The notes are suggested by nature, and then tempered for use in art. Further reference will be made to this question in connection with the major diatonic scale; suffice it to add that, with the exception of the notes marked with an asterisk, all the harmonics in the above paradigm are sufficiently in tune for all practical purposes. No. 7 is a shade flatter than *B* flat, but not enough to debar its use as a fundamental discord; Nos. 11 and 13, on the other hand, are too much out of tune for use as fundamental discords, the former being much sharper than *F*, and the latter much flatter than *A*.

The harmonic series is obtainable from, and may be formed upon, any generator; thus, the first six harmonics of the notes *A*₃, and *E*₂ flat, are shown at (a) and (b) Fig. 3, respectively.

Fig. 3



In the above examples, though the *absolute* pitch of the generators, and of each note in the series, is changed, yet the *relative* pitch of the notes remains exactly the same, as in the series generated from C.

IV. **The Ratio of Intervals.** The principal feature of scientific interest in connection with the harmonic series, is that of the mathematical ratios of its component intervals, the most important of which are included in the following table: —

Fig. 4

INTERVALS	NOTES	RATIOS
Octave	<i>C — C</i>	1 : 2
Major seventh	<i>C — B</i>	8 : 15
Minor seventh	<i>D — C</i>	9 : 16
Major sixth	<i>G — E</i>	3 : 5
Minor sixth	<i>E — C</i>	5 : 8
Perfect fifth	<i>C — G</i>	2 : 3
Perfect fourth	<i>G — C</i>	3 : 4
Major third	<i>C — E</i>	4 : 5
Minor third	<i>E — G</i>	5 : 6
Major tone	<i>C — D</i>	8 : 9
Minor tone	<i>D — E</i>	9 : 10
Major semitone	<i>B — C</i>	15 : 16
Minor semitone	<i>C — D^b</i>	16 : 17

The augmented fourth, and its inversion the diminished fifth, together with the chromatic intervals, will be considered in section IX.

Vibration ratios may also be expressed in the form of fractions; thus, the major third may be represented by the fraction $\frac{4}{3}$. The numerator in the fraction, representing the upper note of the interval, must necessarily, in every case, be a higher number than the denominator.

The length of string necessary to produce a given note may be found by inverting the vibration fraction of the interval; thus, middle *C*, being the perfect fourth of *G*, is obtained from $\frac{3}{4}$ of the fourth or *G* string on the violin.

V. The Major Scale. By means of vibration ratios, if the vibration number of one note is known, the vibration number of every other note in the scale may be obtained; thus, with *C* = 256 vibrations, the vibration number of the other notes of the natural scale is as follows:—

Fig. 5

<i>C</i> , Octave,	$\frac{1}{2} \times 256 = 128$
<i>B</i> , Major seventh,	$\frac{15}{8} \times 256 = 480$
<i>A</i> , Major sixth,	$\frac{5}{3} \times 256 = 426\frac{2}{3}$
<i>G</i> , Perfect fifth,	$\frac{2}{3} \times 256 = 384$
<i>F</i> , Perfect fourth,	$\frac{3}{4} \times 256 = 384$
<i>E</i> , Major third,	$\frac{4}{3} \times 256 = 320$
<i>D</i> , Major second,	$\frac{8}{5} \times 256 = 288$
<i>C</i> ;	256

The same result may also be obtained by employing major and minor thirds only, through the medium of the three primary triads, which, as explained on page 44, constitute the harmonic basis of the major scale. Thus, the vibration number of *E*, the major third of *C*, is 320, as above; that of *G*, the minor third of *E*, $\frac{2}{3} \times 320 = 384$; that of *B*, the major third of *G*, $\frac{4}{3} \times 384 = 480$; that of *D*, the minor third of *B*, $\frac{2}{3} \times 480 = 320$; that of *A*, the minor third below *C*, $\frac{2}{3} \times 256 = 213\frac{1}{3}$; and that of *F*, the major third below *A*, $\frac{4}{3} \times 213\frac{1}{3} = 170\frac{2}{3}$. The vibration numbers of these triads, therefore, is as follows:

Fig. 6

SUBDOMINANT	TONIC	DOMINANT
<i>C</i> = 256	<i>G</i> = 384	<i>D</i> = 576
<i>A</i> = 213 $\frac{1}{3}$	<i>E</i> = 320	<i>B</i> = 480
<i>F</i> = 170 $\frac{2}{3}$	<i>C</i> = 256	<i>G</i> = 384

The *F* and *A* of the subdominant triad must, now, each be raised an octave, when their vibration numbers will become respectively, $341\frac{1}{2}$ and $426\frac{2}{3}$, in order to bring them within the octave, *C* to *C*; and, for the same reason, the *D* of the dominant triad must be lowered an octave, when its vibration number will become 288; and thus the vibration numbers become the same as in Fig. 7.

The successive intervals of the natural scale are of three kinds, major tones, minor tones and semitones, as shown in the following table:

Fig. 7

MAJOR TONE	MINOR TONE	SEMI- TONE	MAJOR TONE	MINOR TONE	MAJOR TONE	SEMI- TONE
<i>C</i> $\frac{2}{3}$	<i>D</i> $\frac{1}{9}$	<i>E</i> $\frac{1}{18}$	<i>F</i> $\frac{2}{3}$	<i>G</i> $\frac{1}{9}$	<i>A</i> $\frac{2}{3}$	<i>B</i> $\frac{1}{18}$ <i>C</i>

The *sum* of any two or more intervals, may be found by multiplying together their vibration fractions; thus,

$$\begin{aligned} \text{since, } \frac{E^+}{C} + \frac{G^-}{E} + \frac{C^+}{G} &= \frac{8ve}{C} \\ \text{so, } \frac{2}{3} \times \frac{1}{9} \times \frac{2}{3} &= \frac{1 \cdot 2 \cdot 0}{8 \cdot 0} = \frac{1}{2} \end{aligned}$$

In like manner, the interval fractions of the major scale (Fig. 7), when multiplied together, will result in 2.

The *difference* between two intervals may be found by dividing the smaller into the greater; thus,

$$\begin{aligned} \text{since, } \frac{C^+}{G} - \frac{B^-}{G} &= \frac{C}{B} \\ \text{so, } \frac{2}{3} \div \frac{1}{2} &= \frac{2}{3} \times \frac{1}{2} = \frac{1}{3} \end{aligned}$$

Hence the interval between *F* and *G* (Fig. 7), is a major tone, being the difference between 4+ and 5+; that between *G* and *A*, is a minor tone, being the difference between 5+ and 6+; and that between *A* and *B*, is a major tone, being the difference between 6+ and 7+.

The natural scale, however, is not absolutely perfect in respect to vibration ratios; the interval, $\frac{A}{D}$ for example, in Fig. 4, is represented by the vibration fraction $\frac{426\frac{2}{3}}{288}$, which is evidently not the exact equivalent of $\frac{4}{3}$. The perfect fifth of D has $\frac{4}{3} \times 288 = 432$ vibrations. It is this discrepancy in the scale to which Dr. Day refers in the quotation from his treatise on Harmony (page 361). In like manner, the third, $\frac{F}{D}$ is not a true minor third. This matter, however, belongs to the subject of Temperament, and need not, therefore, be considered further in the present connection; according to the laws of equal temperament, every note in the natural scale, except, of course, the tonic, is tempered (tuned), more or less sharp or flat, in order that the twelve semitones of the octave may all be perfectly equal.

If the vibration fractions of the notes of the natural scale (Fig. 5) are expressed by equivalent fractions with the least common denominator, as follows:

Fig. 8

<i>C</i>	<i>D</i>	<i>E</i>	<i>F</i>	<i>G</i>	<i>A</i>	<i>B</i>	<i>C</i>
$\frac{24}{24}$	$\frac{27}{24}$	$\frac{30}{24}$	$\frac{32}{24}$	$\frac{36}{24}$	$\frac{40}{24}$	$\frac{45}{24}$	$\frac{48}{24}$

the numerators will represent the actual number of vibrations for each note, in the lowest integral number possible. These numbers (the numerators) play an important part in the harmonic series.

VI. The Subdominant. A natural scale, in which all the notes are in perfect tune, commences on G , No. 24, the dominant of C , and comprises the vibration numbers which appeared above, in Fig. 8, namely:

Fig. 9

<i>G</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	<i>F</i> ♯	<i>G</i>
24	27	30	32	36	40	45	48

Wherefore, in order to obtain the scale of *C* in perfect tune, it is necessary to resort to *F* (the subdominant) as a generator; hence, the subdominant may be regarded as the "patriarch" or "dowager queen" of the scale. Thus, the note *C* grows, as it were, naturally out of the note *F*, just as the note *G* grows out of the note *C*, and the note *D* out of the note *G*, and so on, ever by rising perfect fifths; nor does the series stop at any point whatever within the scale; on the contrary, it is continued through the succeeding scales, only to cease in its application to art by the limitations of musical notation. Thus, the series of fundamental discords upon which the Modern Enharmonic Scale is based, is *justified by nature*.

The reason for the difficulty in connection with the note *F*, and its major third, *A*, in the harmonic series of *C*, will now be apparent. *F*, as the 17th harmonic of *E*, No. 5, is practically in perfect tune, but even this note is not absolutely true, for the fraction $\frac{17}{16}$ is not the exact equivalent of $\frac{3}{2}$.

VII. Secondary Harmonics. It is rarely necessary, to consider the harmonic series beyond No. 17, the minor ninth. Members of the series above this note are chiefly valuable from the standpoint of secondary harmonics, that is to say, as harmonics of one of the earlier members; for, theoretically, the harmonics themselves also generate harmonics, those derived from No. 3 being termed secondary, and those from No. 5, tertiary harmonics. A simple triad, as at (a), Fig. 10, therefore, not only generates a triple series of harmonics, as shown at (b), (c) and (d) (up to No. 6), but generates also the secondary harmonics as shown at (e), (f) and (g) (up to No. 3), and the tertiary harmonics as shown at (h), (i) and (j) (up to No. 2).

Fig. 10



In the case of a minor triad, some extremely harsh dissonances arise among the harmonics, for, the major third of the root clashes with the minor third of the triad; hence the reason why composers formerly preferred the *Tierce de Picardie* for the last chord of compositions in a minor key.

Perfectly pure tones, that is to say, sounds unaccompanied by any harmonics, are extremely rare. Such tones are obtainable from tuning forks, and from flutes and soft stopped pipes on the organ; otherwise, practically every sound in music is a compound or composite tone. Harmonics are rarely audible as individual sounds, unless a note is long sustained, but their presence determines to a large degree the character of the sound. If the above triad (Fig. 10, *a*), were played an octave lower, the harmonics, both the consonances and the dissonances, would become far more pronounced, and others — higher harmonics — would enter and add still further to the pandemonium among the upper partials. If, on the other hand, the triad were played an octave higher, the harmonics would be far less pronounced; and if played an octave higher still, their presence would scarcely be appreciated. Hence, the reason why chords, in close position in the lower octaves of the pianoforte are cloudy and cumbersome, why those in the middle of the instrument are rich and sonorous, and why those in the upper octaves are thin and non-resonant.

All harmonics, other than those represented by prime numbers, may also be regarded as secondary harmonics. The vibration number of a secondary harmonic may be found by multiplying together the vibration numbers of its component harmonics. Thus, *G*, being the third harmonic of *C*, and *D*, the third harmonic of *G*, it follows that *D* (as shown in Fig. 2), is ($3 \times 3 = 9$) the ninth harmonic of *C*. Again, *B*, as (1), the third harmonic of *E*, the fifth harmonic of *C*, or as (2), the fifth harmonic of *G*, the third harmonic of *C*, is ($3 \times 5 = 15$) the fifteenth harmonic of *C*.

VIII. The Comma. The two notes, *F* and *A*, in the scale of *C*, nominally the eleventh and thirteenth harmonics, can never occur as pure primary harmonics, for, no member of the arithmetic

series, 1, 2, 4, 8, 16, etc. (representing the various octaves of the note *C*), is exactly divisible by 3 ($\frac{2}{3}$ and $\frac{4}{3}$ being the vibration fractions, respectively, of a perfect fourth and a major sixth). These notes may be obtained as secondary harmonics, *F*, as the third harmonic of *B* flat (No. 7), with the vibration number 21, and *A*, as the third harmonic of *D* (No. 9), with the vibration number 27. Thus, the vibration ratio of each note of the natural scale of *C*, for ordinary purposes, will be as follows:—

Fig. 11

<i>C</i>	<i>D</i>	<i>E</i>	<i>F</i>	<i>G</i>	<i>A</i>	<i>B</i>	<i>C</i>
16	18	20	21	24	27	30	32

The interval, *C* to *F*, however, is a shade flat, just as the *B*-flat from which *F* is derived, is a shade flatter than the true *B*-flat. The exact difference between these two perfect fourths may be found by reducing their vibration fractions to a common denominator; when $\frac{2}{3}$ and $\frac{4}{3}$ become respectively, $\frac{8}{24}$ and $\frac{32}{24}$. The minute interval, called a comma, schisma, or diesis, between the two *F*'s, may, therefore, be represented by the ratio 63 : 64, which may be proved by adding the vibration fraction of this comma to that of the lesser perfect fourth, the sum of which will be the vibration fraction of the true fourth, thus:

$$\frac{2}{3} \times \frac{8}{3} = \frac{16}{9}$$

The interval, *C* to *A*, on the other hand, is a shade sharp, as may be determined by comparing the vibration fractions $\frac{2}{3}$ and $\frac{3}{2}$. Reduced to fractions with a common denominator, $\frac{8}{16}$ and $\frac{24}{16}$, respectively, a comma (sometimes called the "comma of Didymus") arises, which is represented by the ratio 80 : 81; and as before,

$$\frac{27}{16} + \frac{81}{80} = \frac{27}{16} \times \frac{80}{81} = \frac{5}{3}$$

The comma, 80 : 81, is also the difference between the major and the minor tone, thus:—

$$\frac{9}{8} \div \frac{10}{9} = \frac{81}{80}$$

It will thus be seen that the so-called 11th and 13th harmonics cannot consistently be regarded or treated as forming part of the fundamental discord upon the generator from which they are nominally derived; the ninths, both major and minor, on the other hand, are perfectly in tune. The 11th and 13th, moreover, are obtainable only as secondary harmonics, whereas the 7th and minor 9th (17th) are primary harmonics, while the major 9th is both a primary and a secondary harmonic.

The so-called fundamental discords of the 11th and 13th, therefore, are contrary to the principles of acoustics; and it was shown, moreover, in the Introduction to Part III, that they were also contrary to the principles of harmony. Wherefore, they cannot be justified by either the science or art of music.

IX. Chromatic Notes. The chromatic notes of the modern enharmonic scale may all be obtained from *C*, as a generator. The "sharps" are derived through the diatonic note a major third below, thus:—

$$\text{The vibration number of } \left\{ \begin{array}{l} G \text{ sharp,} \\ F \text{ sharp,} \\ D \text{ sharp,} \\ C \text{ sharp,} \end{array} \right\} \text{ the major third of } \left\{ \begin{array}{l} E, \text{ is } (5 \times 5) \text{ } 25; \\ D, \text{ is } (9 \times 5) \text{ } 45; \\ B, \text{ is } (15 \times 5) \text{ } 75; \text{ and} \\ A, \text{ is } (27 \times 5) \text{ } 135. \end{array} \right.$$

The "flats," *B* flat, *D* flat and *E* flat, occur as prime numbers in the series. *A* flat is obtained as the 17th harmonic of *G*, its vibration number being $(17 \times 3) \text{ } 51$.

The extreme chromatic, *A* sharp, as the major third of *F* sharp, has the vibration number of $(45 \times 5) \text{ } 225$; and the other extreme chromatic, *G* flat, as the minor ninth of *G*, has the vibration number of $(21 \times 17) \text{ } 357$; but, very little importance is attached to such "extreme" harmonics.

The augmented fourth (tritone) is the sum of the three tones, *F* to *B* (see Fig. 7), its vibration fraction, therefore, will be.

$$\frac{9}{8} \times \frac{10}{9} \times \frac{9}{8} = \frac{45}{32}$$

which is verified by the interval *C* to *F* sharp, in the scale of *G*, Fig. 9. The inversion of the augmented fourth, the diminished fifth, has the vibration fraction $\frac{3}{4}$, which is obtained by inverting the fraction $\frac{4}{3}$, and then doubling the numerator, to represent the octave of the lower note. The diminished 5th, Nos. 5 and 7, of the harmonic series, is not in tune, No. 7 being a shade too flat.

Just as there are two forms of the diatonic semitone, namely, the major, $\frac{1}{2}$, and the minor, $\frac{1}{3}$, so there are also two forms of the chromatic semitone, the major and the minor, which are obtained by subtracting the *major* diatonic semitone from, respectively, the major and minor tones; thus, the vibration fraction of the major chromatic semitone is $(\frac{2}{3} \times \frac{1}{2}) \frac{1}{3}$; and that of the minor chromatic semitone $(\frac{1}{3} \times \frac{1}{2}) \frac{1}{6}$, both of which are verified by vibration numbers previously considered. The chromatic semitones obtainable by subtracting the *minor* diatonic semitone from the major and minor tones, are not recognized. The vibration number of a diminished octave may be obtained by inverting, as before, the above fractions.

The vibration fractions of the three important chromatic intervals, the augmented fifth — $\frac{3}{2}$, the augmented sixth — $\frac{5}{3}$, and the diminished seventh — $\frac{7}{4}$, as they occur in the harmonic series, are sufficiently approximate for all general purposes.

The following table shows the ratios of the less important intervals, those not included in Fig. 4.

Fig. 12

INTERVALS	NOTES	RATIOS
Diminished octave	<i>C</i> ♯ — <i>C</i>	135 : 256
Diminished seventh	<i>E</i> — <i>D</i> ♭	10 : 17
Augmented sixth	<i>D</i> ♭ — <i>B</i>	17 : 30
Diminished fifth	<i>F</i> ♯ — <i>C</i>	45 : 64
Augmented fourth	<i>C</i> — <i>F</i> ♯	64 : 45
Diminished fourth	<i>G</i> ♯ — <i>C</i>	25 : 32

INTERVALS	NOTES	RATIOS
Diminished third	$B - D_b$	15 : 17
Augmented second	$D_b - E$	17 : 20
Major chromatic semitone	$C - C^\sharp$	128 : 135
Minor chromatic semitone	$G - G^\sharp$	24 : 25

To the above table may be added another augmented second, namely, $C - D^\sharp$, $\frac{7}{4}$, together with its inversion the diminished seventh, $\frac{17}{8}$.

X. Equal Temperament. The infinitesimal interval between G sharp, No. 50, and A flat, No. 51, in the harmonic series of C , is termed an enharmonic diesis; and it is worthy of notice that the pitch of A flat (a diatonic semitone above G , No. 48), is higher than that of G sharp (a chromatic semitone above G). A similar interval, but not exactly the same, arises when three major thirds above a given note are compared with the octave of the same note; thus, B sharp, the third of G sharp, the third of E , the third of C , is ($5 \times 5 \times 5$) No. 125, while its enharmonic equivalent, C , is a shade higher in pitch, being No. 128.¹

On the other hand, if B sharp is obtained from twelve rising perfect fifths, its vibration number will be 531441, as compared with 524288, the vibration number of its enharmonic equivalent; thus, B sharp is now a shade higher in pitch than C . The enharmonic diesis, in this case, is termed the Pythagorean comma²; the ratio of this comma, for all practical purposes may be represented by the terms 73 : 74, though, mathematically, the above cumbersome numbers cannot be reduced. In equal temperament, there is no difference between G sharp and A flat; the enharmonic diesis ceases to exist, for, each of the perfect fifths is reduced by $\frac{1}{12}$ of the Pythagorean comma, so that B sharp and C become one and

¹ There is a tendency on the part of vocalists and violinists to exaggerate somewhat both sharps and flats, so that in actual performance the pitch of G sharp may prove to be a shade higher than that of A flat.

² The Greeks, from whom the modern scales are derived, through the ecclesiastical modes of the middle ages, were thoroughly familiar with the philosophy of vibration ratios. Euclid wrote a work, *Sectio Canonis*, the division of the string, on this very subject.

the same note. The Pythagorean comma is equal to about $\frac{1}{3}$ of a semitone, and to about $\frac{1}{4}$ of the ordinary comma.

The vibration number of the equally tempered fifth above *C* (with 256 vibrations) may, therefore, be obtained in the following manner:—

Fig. 13

$$\begin{aligned} 2 : 3 &:: 256 : 384 = \text{a true fifth, and} \\ 74 : 73 &:: 384 : 378.8, \text{ so that} \\ 384 - 378.8 &= 5.2 = \text{the Pythagorean comma;} \\ \frac{1}{3} \text{ of } 5.2 &= .4, \text{ therefore,} \\ 384 - .4 &= 383.6 = \text{the equally tempered fifth above } C. \end{aligned}$$

All other equally tempered intervals are obtained through the medium of perfect fifths; thus, the semitone, is obtained by taking seven perfect fifths up and then four octaves down, and the vibration number of the note is reduced by $\frac{1}{12}$ of the Pythagorean comma.

XI. Mean-tone Temperament. The unequal, or mean-tone system of temperament, owed its origin to the fact that four successively rising fifths result in an interval exactly a comma ($\frac{1}{3}$) sharper than a major third, that is to say, the resultant major third comprises two major tones; wherefore, by reducing each of the fifths one quarter of a comma, a true major third is obtained. Thus, in the key of *C*, the four notes, *G*, *D*, *A*, *E*, are first obtained, with the *D* in geometrical mean (hence the name "mean-tone"), between *C* and *E*. Then, commencing on *E*, a similar succession of fifths is taken, and the notes *B*, *F*#, *C*# and *G*# are obtained. Then, returning to *C*, four successively falling fifths are taken, and the notes *F*, *B*♭, *E*♭, and *A*♭ are obtained. But, the *A*♭ is a distinct note from *G*#, so that there are thirteen notes to the octave; for, with *C* = 256, the vibration number of *G*# (two major thirds up) is 400, whereas, that of *A*♭ (one major third down) is $400\frac{2}{3}$. The major thirds and minor sixths in this system are in perfect tune, but the minor thirds and perfect fifths are both a quarter of a comma flat, and their inversions, the major sixth and perfect

fourth, of course, both a quarter of a comma sharp. It is unnecessary to consider this subject further; suffice it to say, that the break at $G\sharp - A\flat$ resulted in certain keys, called "wolves," being unavailable for use at all, wherefore, modulation is either restricted or even impracticable, and, in a word, the system is not adapted nor adaptable to modern requirements.

The vibration number of the mean-tone fifth above C (with 256 vibrations) may, therefore, be obtained in the following manner:—

Fig. 14

$2 : 3 :: 256 : 384 =$ a true fifth, and

$81 : 80 :: 384 : 379.2$, so that

$384 - 379.2 = 4.8 =$ the comma of Didymus;

$\frac{1}{4}$ of $4.8 = 1.2$, therefore,

$384 - 1.2 = 382.8 =$ the mean-tone fifth above C .

XII. Resultant Tones. In addition to the harmonics generated by each member of an interval, individually, there are also what are called the *resultant* tones. These tones are of two kinds, the summational and the differential; the vibration number of the former is the sum of the vibration numbers of the interval, and that of the latter, the difference of these numbers. Thus, of the three intervals composing the triad at (a), Fig. 15, the summational tone of the major third ($4 : 5$) is No. 9 (b), that of the minor third ($5 : 6$) is No. 11 (d), and that of the perfect fifth ($4 : 6$) is No. 10 (c). The differential tone of each of the thirds is No. 1 (e), and that of the perfect fifth, No. 2 (f).

Fig. 15



Wherefore, when to the overtones of this simple triad (as given in Fig. 10), the resultant tones are added, a formidable array of consonance and dissonance is the result.

Differential tones were discovered by Tartini, about the year 1714; hence, they are sometimes called "Tartini's tones."

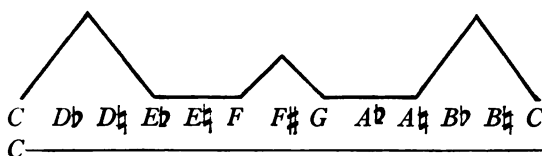
Resultant tones differ according to the position of the triad. In root position, as above, the summational tones are Nos. 9, 10, 11; in the first inversion they are Nos. 7, 11, 13; while in the second inversion, they are Nos. 7, 8, 9. Wherefore, the six-four chord, from this standpoint, is the least dissonant of the three positions; but this feature of interest in no way affects the art-use of the chord.

The reason why the perfect fourth in harmony is regarded as a dissonant interval when it exists between the bass and any upper part is attributable to the position this interval occupies in relation to the generator in the harmonic series. The harmonic series suggests the principles of harmony, it does not furnish the laws of composition. Composition appertains to the art of music; acoustics, to the science of music.

XIII. Interference. When the pitch of two notes differs by one vibration, what is termed a "beat" arises; when there is a difference of two vibrations, two beats arise, and so on. These beats occur in the form of pulsations, or slight reinforcements of sound, due to the alternate coincidence and interference of the sound-waves, and their presence, in a greater or lesser degree of prominence, is the direct cause, respectively, of dissonance and consonance. If two strings are tuned, each to *C* with 256 vibrations, and then one of them be gradually raised in pitch, the beats rapidly give rise to a harsh effect, which becomes more and more dissonant until the semitone (*D* flat) is reached, after which the dissonance gradually diminishes, and passing through the major second, it merges into consonance with the approach of the minor third. Consonance remains while the gradually rising pitch passes through the minor and major thirds and the perfect fourth, after which the harshness of the beats appears again on reaching the augmented fourth, and again disappears on reaching the per-

fect fifth. Consonance once more remains while the rising pitch passes through the perfect fifth and the major and minor sixths, after which the beats gradually give rise to dissonance as the minor seventh is approached, and it becomes more intense with the appearance of the major seventh, from which point the dissonance rapidly diminishes, and entirely disappears when the octave is reached. The wave-like line in the following diagram, in a manner represents these variations of consonance and dissonance: —

Fig. 16



An interesting phenomenon arises in connection with beats; if the following passage be played on the pianoforte: —

Fig. 17



the effect of the interval at (a) will closely assimilate that of an octave, and the ear is thus deceived, a note below the compass of the pianoforte being heard in the imagination.

Although definite lines are drawn between consonance and dissonance according to the laws of equal temperament, yet from the standpoint of beats, no actual point of distinction can be said to exist. Dissonance merges into consonance, and consonance into dissonance, almost imperceptibly, at a point called the "beating

distance." Beats play an important part in pianoforte tuning, the perfect fifth above middle *C* being tuned about two beats per second flatter than the perfect fifth of nature.

XIV. Sources of Sounds. The chief sources of musical sounds are strings and pipes.

The vibrations of strings are produced by

1. Striking (pianoforte, clavichord, dulcimer);
2. Bowing (violin, viola, violoncello); and
3. Plucking (harp, harpsichord, mandolin).

The most important uses of the pipe are, as:

1. Orchestral instruments, namely:

WOOD-WIND

Flute

Clarinet (single reed)

Oboe

Bassoon } (double reed)

BRASS

Horn

Trumpet

Cornet

Trombone

2. Organ pipes, which are of two kinds, the flue and the reed; flue pipes are also of two kinds, open and stopped, the latter sounding an octave lower than the former.

Other sources of musical sounds are: the reed (harmonium, concertina), the membrane (drum, tambourine), the rod (tuning fork, musical box), the plate (cymbals) and the bell.

The tone quality or character (timbre) of a sound depends upon the order, number and intensity of the overtones or harmonics.

XV. Strings. The vibrations of a stretched string are of three kinds, transverse, longitudinal and torsional. Longitudinal and torsional vibrations play little or no part in music. Transverse vibrations vary

- i. directly proportional to the square root of the tension or stretching force (or weight);
- ii. inversely proportional to the length ;
- iii. inversely proportional to the diameter ; and

iv. inversely proportional to the square root of the density.

When the string vibrates in halves, each part is called a ventral segment; the point of comparative rest between them is called a node, and the middle of the segment an antinode. When the string vibrates in thirds, there are three segments and two nodes; and so on.

Strings flatten with a rise in temperature, and sharpen with a fall in temperature.

XVI. Pipes. The sound waves of an open pipe are twice the length of the pipe; those of a stopped pipe, four times the length of the pipe. The number of vibrations per second of an open organ pipe, 8 ft. in length, or of a closed pipe, 4 ft. in length, will, therefore, be $1\frac{1}{2} \times 70 = 70$, which is about the vibration number of C_2 ; the philosophical pitch of this note is 64 vibrations, but organ pipes are made a little longer than their nominal length.

The harmonics of an open pipe follow in the same order as those of the stretched string; but in the case of a stopped pipe, which sounds an octave lower than an open pipe of the same length, the harmonics occur in the order of the "odd" numbers only, that is to say, the overtones are the 3rd, 5th and 7th, etc., in the series.

The length of pipe necessary to produce a given tone may be found by inverting the vibration fraction of the interval; thus, the perfect fifth of 4 ft. C , will be obtained from a pipe of $\frac{3}{4}$ of 4 ft. = $2\frac{3}{4}$ ft.

The harmonics of flutes, oboes, bassoons, horns, trumpets and trombones, occur in the order of the harmonic series; but those of the clarinet occur in the order of the "odd" numbers only, as in the case of a closed pipe. The bore (tube) of the clarinet is cylindrical, that of the oboe, conical.

Pipes sharpen with a rise in temperature, wooden pipes more so than metal, and vice versa. Reeds, as in the harmonium, etc., like strings, flatten with a rise in temperature, and vice versa.

XVII. Color and Sound. An interesting analogy exists between the seven colors of the spectrum and the seven notes of

the natural scale. Although the absolute rapidity of the vibrations of colors is many million times that of sounds, yet, as will be seen from the following table, there is a remarkable degree of similarity in the relative rapidity of their vibrations.

Fig. 18

Comparative vibration ratios of color and sound			
Color	Relative vibration number	Sound	Absolute vibration number
Violet	727	Leading-note	844
Indigo	672	Sub-median	750
Blue	632	Dominant	675
Green	590	Sub-dominant	600
Yellow	545	Mediant	562
Orange	506	Supertonic	506
Red	457	Tonic*	450

*Tonic = B² flat.

The color vibrations are in billions; thus, the absolute vibration number of red, is 457,000,000,000,000. The numbers are, doubtless, only approximate; indeed, different authorities give different numbers, but the difference in number may be due to difference in shade, for, the relative vibrations are practically the same, that is to say, red is the gravest tone, orange, the next gravest, and so on. It is said that the great classic painters obtained their most harmonious effects by the use of color combinations the vibration numbers of which are in conformity with the vibration ratios of consonant intervals; and future developments may prove that the sister arts of painting and music are more closely knit together than has ever been surmised in the past. At the present time, however, the bond of union between color and

sound is chiefly a matter of scientific interest; it is one of the links in the great chain of universal order, which year by year repaints the wayside flower, and which, through the countless ages, has governed the harmony of the spheres.

XVIII. The Minor Scale. The modern major scale is a modification of the natural scale, being modified in accordance with the principles of equal temperament, so that, and in order that, any note in music may be employed as the tonic of a key, that any chord in any key may be available for use in every key, that modulation or interchange of key may be wholly unrestricted.

The modern minor scale, on the other hand, is not obtained from nature; it is essentially an artificial scale, that is to say, it is "made for art," but in other respects, in use and purpose, it is identically the same as the major. The major and minor scales may be likened to the males and females of the animal and vegetable kingdoms. Furthermore, whereas the major triad is natural, the minor triad is artificial; for, the minor triad (in perfect tune) is not obtainable from its own root as a generator, as in the case of the major triad. Nos. 10, 12 and 15, constitute a true minor triad, but No. 10 is not an octave of the generator; this triad is sometimes called the co-relative triad of the tonic. Nos. 16, 19 and 24, of the harmonic series, do not constitute a true minor triad, No. 19, not being a true minor third above No. 16 ($\frac{8}{5} \times 16 = 19\frac{1}{2}$). Minor triads are obtained from major triads; they are formed by two different methods, (1) the relative or diatonic method, and (2) the affinitive or chromatic method. The root, in the latter case, is the same as that of the major triad; in the former case, the root is a minor third below that of the major triad. These methods are equally important.

Just as the three triads, IV+, I+ and V+, constitute the harmonic basis of the major scale (page 44), so their relative minors constitute the harmonic basis of the relative minor scale, and their affinitive minors constitute the harmonic basis of the affinitive minor scale. In each case, the seventh degree is chromatically raised, in order to form the leading-note.

The vibration fractions of the component intervals of *A* minor (harmonic form) the relative minor of *C*, all the notes except *G* sharp being taken from the scale of *C* (Fig. 7), are as follows:—

Fig. 19

A $\frac{2}{3}$ *B* $\frac{1}{3}$ *C* $\frac{2}{3}$ *D* $\frac{1}{2}$ *E* $\frac{1}{3}$ *F* $\frac{1}{4}$ *G* \sharp $\frac{1}{3}$ *A*

This scale, however, is not wholly satisfactory, for the perfect fourth of the tonic, *A* — *D*, is not a true fourth.

The vibration fractions of the component intervals of *C* minor (harmonic form), the affinitive minor of *C* major, are as follows:—

Fig. 20

C $\frac{2}{3}$ *D* $\frac{1}{3}$ *E* \flat $\frac{1}{2}$ *F* $\frac{2}{3}$ *G* $\frac{1}{3}$ *A* \flat $\frac{1}{4}$ *B* $\frac{1}{3}$ *C*

All the perfect fourths in this scale are true, wherefore, the affinitive minor, from the standpoint of science; but from this standpoint only, is a more satisfactory scale in relation to the tonic, than the relative minor.

In the melodic form of the minor scale, the upper tetrachord, ascending, is the same as in the major scale; in descending, from *C* to *B* flat is a minor tone, and from *B* flat to *A* flat, a major tone.

XIX. Triads and Tetrads. The simultaneous combination of all the consonant intervals results in consonant chords or concords; of which there are two kinds, the major or natural, and the minor or artificial.

The addition of the seventh harmonic to the notes of the major triad, results in a primary tetrad; but this particular chord (the tonic seventh) is of comparatively rare occurrence, for, the function of the tonic chord is "rest," while all discords are necessarily of a restless character; the seventh, moreover, in this case, is a chromatic note. In order to obtain a diatonic tetrad, recourse must be made to the fifth of the generator (the dominant of the key), the fourth, fifth, sixth and seventh harmonics of which furnish the notes of the primary diatonic tetrad, or dominant seventh, as it is generally called. And, just as this chord is evolved from the tonic so it is also resolved upon the tonic, in accordance with the natural laws of evolution and revolution.

The seventh harmonic of the dominant, as has already been seen, is flatter than the true perfect fourth of the tonic by the minute interval $\frac{1}{4}$, a practically imperceptible difference which in no way affects the art-use of the chord.

In like manner, a primary tetrad may be formed upon the supertonic, as the fifth of the dominant, and so by successively rising fifths, upon the submediant, the mediant and the leading-note; all of these chords, however, excepting alone the dominant seventh, are chromatic tetrads. To continue the series beyond the leading-note would result in a primary tetrad upon a note foreign to the diatonic scale of the original tonic, namely, the chromatically raised subdominant, and the chord would comprise an extreme chromatic note, the chromatically raised submediant; the chord, would, therefore, be an extreme chromatic chord, and as such, it is on the border line between the original tonic and the succeeding dominant key. While, a primary tetrad on the next perfect fifth, the chromatically raised tonic, would comprise a note altogether foreign to the original tonality, namely, the chromatically raised mediant, a note, which, as the enharmonic equivalent of the subdominant, disturbs the integrity of the diatonic scale, and the use of which, therefore, is contrary to the principles of harmony.

The establishment of one diatonic tetrad would naturally lead to the employment of others, and thus a tetrad becomes available for use on every degree of the scale, those formed upon notes other than the dominant being termed secondary tetrads.

XX. Pentads, etc. The addition of the ninth harmonic to the notes of the primary tetrad upon the tonic results in a primary major pentad; but this particular chord (the tonic ninth), for reasons explained above, is of comparatively rare occurrence; the natural major pentad like the natural tetrad, occurs upon the dominant. The eighth, tenth, twelfth, fourteenth and seventeenth harmonics, constitute a primary minor pentad. Primary pentads, both major and minor, may be formed (as in the case of primary tetrads) upon the supertonic, the submediant, the mediant and the leading-note, all of these chords being chromatic primary pentads.

Of all the diatonic notes, the subdominant is the least valuable from the standpoint of a generator; upon this note, the "patriarch" (page x) of the scale, a primary tetrad and a major pentad may be formed, but a minor pentad comprises an extreme chromatic, the chromatically lowered dominant. While, upon the subtonic, the perfect fifth below the subdominant, although a primary tetrad and a major pentad are available, yet a minor pentad is impracticable; for, the chord would comprise the flattened tonic, the enharmonic equivalent of the leading-note, a note, therefore, foreign to the original tonality.

The leading (or minor) and diminished tetrads, are evidently obtained from the same source as the major and minor pentads, of which they are respectively the derivatives.


Suspensions and auxiliary notes, being unessential dissonances, do not arise directly in connection with the harmonic series; they are employed in harmony as melodic embellishments. Secondary pentads are rarely employed as independent chords, the ninth usually being treated as a suspension or an auxiliary note; and, both diatonic and chromatic modifications may be regarded as being in the same category.

Wherefore, the whole science of harmony may be said to have its origin in the harmonic chord of nature, and, thus, musical composition is the direct result of the gradual growth and development of the art-use of the harmonic series.

QUESTIONS

1. Name and describe the properties of the sound wave.
2. Compare sound waves and water waves.
3. Find the wave length of $A = 440$ vibrations.
4. Find the vibration number of a note the wave length of which is 7 feet.
5. Find the rate of travel of a sound with 218 vibrations and a wave length of 5 feet. Also state the temperature of the atmosphere.

6. Explain the meaning of philosophical pitch.
7. Give the pitch, length of string, and wave length of tenor *C*.
8. Write the harmonic series of *F*, up to No. 20.
9. Name the successive intervals obtainable from the aliquot divisions of a stretched string, up to the seventeenth part.
10. Differentiate between acute and grave pitch; natural and tempered pitch; absolute and relative pitch.
11. Give the vibration ratios of the intervals: (a) *F* to *B* flat; (b) *D* to *A*; (c) *C* to *E* flat; (d) *E* to *G* sharp; (e) *A* to *F* sharp; and (f) *D* sharp to *B*.
12. Explain the difference between major and minor tones, and major and minor semitones.
13. Compare the pitch of the note *A* as the supertonic of *G*, with that of *A* as the mediant of *F*.
14. Give the harmonic number of each of the following notes in the series of the generator as indicated: —

Harmonics	(a)	(b)	(c)	(d)	(e)	(f)
						
Generators	<i>E</i>	<i>A</i> ♭	<i>B</i>	<i>D</i> ♭	<i>F</i> ♯	<i>G</i> ♭

15. State what length of string is necessary to produce: (a) a major third; (b) a minor seventh; (c) a major sixth; and (d) a minor second.
16. Given, tonic = 100, find the vibration number of each note of the natural scale.
17. Given, tonic = 320, find the vibration number of the notes of the dominant and subdominant triads.
18. Given, tonic = 288, find the vibration number of the notes of the supertonic and mediant triads.
19. Find the interval between the notes, the vibration numbers of which are : (a) 248 and 279; (b) 106 and 159; (c) 111 and 185; (d) 115 and 138; (e) 177 and 236; (f) 188 and 235; (g) 205 and 328; and (h) 435 and 464.

20. Show that the scale of *A* flat, with just intonation, is not obtainable from *A* flat as a generator. From what note is this scale obtainable?

21. Given $C = 516$, compare F , No. 21, with F , a true perfect fourth.

22. Explain the scientific difference between a diatonic and a chromatic semitone.

23. Explain the meaning, and give examples of, secondary and tertiary harmonics.

24. Given $C = 256$, find the vibration fractions of the following semitones: (a) F to F sharp; (b) F sharp to G ; (c) G to G sharp; and (d) G sharp to A .

25. State the significance attached to the fractions $\frac{3}{4}$, $\frac{7}{8}$, $\frac{9}{16}$.

26. Give the vibration ratio of an augmented fifth, an augmented sixth and a diminished seventh.

27. Find the vibration number of the note D , in the scale of C , according to equal temperament.

28. Find the vibration number of the note D , in the scale of C , according to mean-tone temperament.

29. Given $C = 256$, find the vibration number of the note A , (a) according to true intonation, (b) equal temperament, and (c) unequal temperament.

30. Explain the meaning of the term "wolves," as employed in reference to certain keys, in the eighteenth century.

31. Give both the summational and differential tones of the intervals: (a) D to F sharp; (b) E to A ; (c) F to C ; (d) G to E ; (e) C to E flat; and (f) D to B flat.

32. Write the summational tones arising from the triad of C minor and its inversions.

33. Describe the phenomenon known as "beats." What is meant by "beating distance."

34. Name and classify the chief sources of musical sounds.

35. Explain the transverse vibrations of strings. In what respects do they vary? Define node, anti-node and ventral segment.

36. Name the first five overtones of the note *D* (third line in the bass) when played upon the following organ stops: (*a*) Bourdon, (*b*) Open diapason, (*c*) Stopped diapason, (*d*) Principal, and (*e*) Oboe. And, in each case, mention the wave length of the sound.

37. State the effect of a rise in temperature upon: (*a*) strings, (*b*) reeds, (*c*) metal pipes, and (*d*) wooden pipes.

38. Find the length of pipe necessary to produce each note in the scale commencing on middle *C*, this note being obtained from a pipe two feet in length.

39. Explain the difference between the oboe and clarinet in regard to the bore (shape) of the tube and the overtones.

40. Name the colors of the spectrum, and compare their respective vibrations with those of the notes of the natural scale.

41. Explain the origin of the minor triad; and show that the minor is an artificial, whereas the major is a natural triad.

42. Describe the methods by which the minor scale is obtained; refer to the normal, harmonic and melodic forms of the scale.

43. Give the vibration number of each note in the scales of *B* minor — harmonic form, and *G* minor — melodic form; with $B = 240$, and $G = 192$.

44. Explain the significance of the seventh harmonic in relation to fundamental discords. What is meant by chords of “rest” and “motion”? Is the 7th, in the dominant seventh, a primary or a secondary harmonic?

45. Show that primary pentads (chords of the ninth), both major and minor, are justified by the harmonic chord of nature.

46. Write a short account of the origin and use of the artificial tetrads, and show, from their natural resolution, that these chords must be regarded as derivatives or incomplete forms of pentads.

47. Prove, by reference to the harmonic chord of nature, that the so-called chords of the eleventh and thirteenth cannot be justified from a scientific point of view.

48. Explain the difference between essential and unessential dissonances, and show that the former originated in science, the latter, in art.

49. Describe the various fundamental discords, tetrads and pentads, primary and secondary, in both the major and minor mode, which arise from the supertonic as a generator; and show that the three forms of the chord of the augmented sixth are obtained by combining notes comprised by these discords.

50. Show that the material of modern music, that is to say, the modern enharmonic scale, is obtained naturally from the harmonic chord of nature.

SUMMARY

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- iii. The Harmonic Series.
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